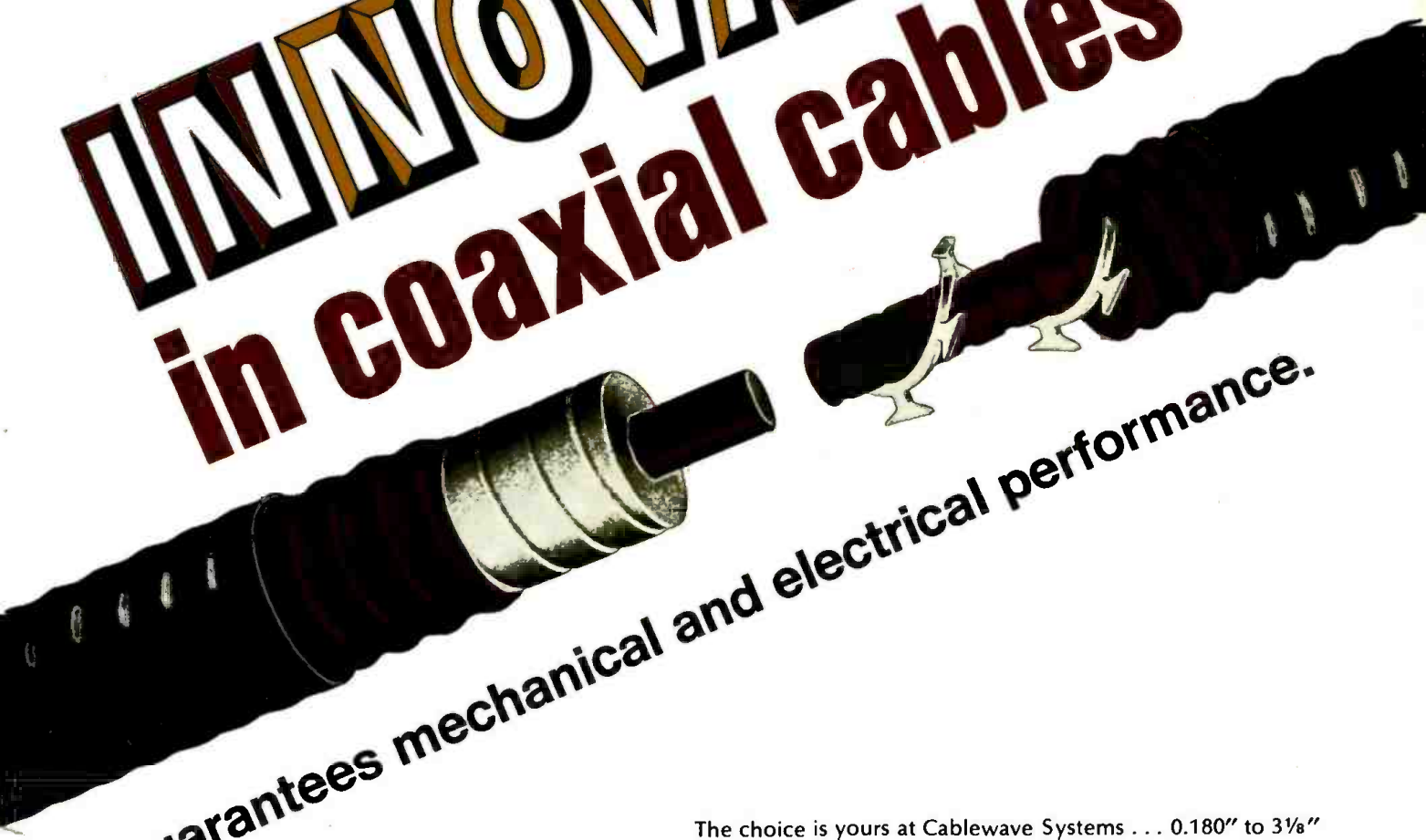
FEBRUARY 1975

BM/E

BROADCAST MANAGEMENT/ENGINEERING

The New Tape Machines: They Save Time And Money.

INNOVATIONS in coaxial cables



guarantees mechanical and electrical performance.

The choice is yours at Cablewave Systems . . . 0.180" to 3⅛" outer conductors of smooth wall aluminum or corrugated copper; dielectric insulators of air (extruded spiral polyethylene or special helix designs), foam polyethylene center conductors of copper or copper clad aluminum . . . each engineered to excel in its area of application whether it be phasing lines for broadcasting, microwave antenna feeders, or delay line applications and each with a full range of connectors and accessories.

By giving you the widest selection of cable types, connectors, sizes and lengths through new and patented manufacturing techniques, plus a complete selection of compatible connectors, you are assured of getting the ideal cable assembly for your specific application — there's no compromising. Cablewave Systems Inc., 60 Dodge Avenue, North Haven, Conn. 06473, 203-239-3311.

Call or write for catalog 401A and get all the details on our complete line of Coaxial Cables and accessories.

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Cablewave Systems Inc.

A Corporation owned by Phelps Dodge & Kabelmetal

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NOW . . . we've added crystal-controlled off-the-air UHF tuning.

For those critical UHF requirements, DYNAIR's new crystal-controlled VT-4BU plug-in tuner assures frequency stability of 0.005% on any specified UHF channel. In addition, all channels from 14 through 83 may be manually tuned. An AFC lock may be used, if desired, for additional stability on these channels.

BROADCASTERS find the new UHF tuner and the RX-4B DYNA-TUNE Demodulator an ideal combination for remote broadcast monitoring, especially so when an optional video chopper is added for checks of modulation percentage.

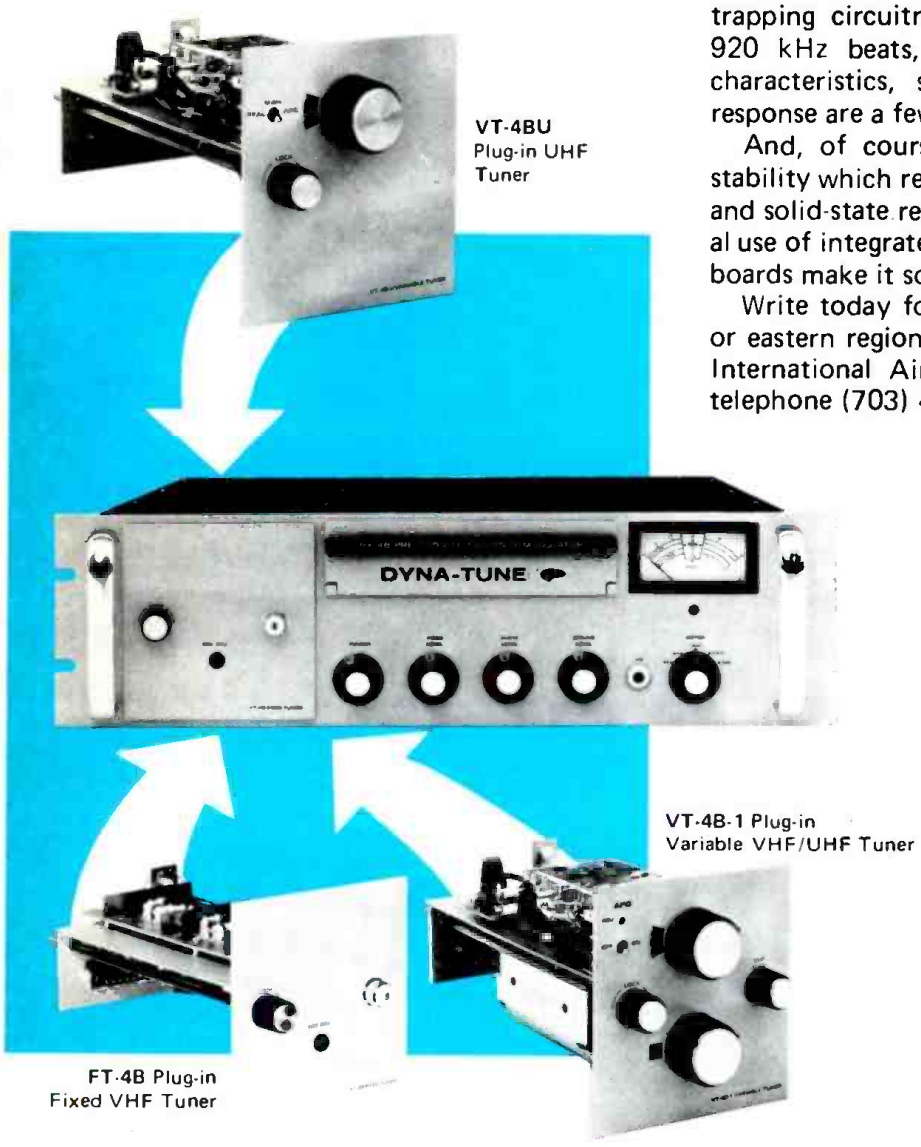
Adjustable color compensation results in a nearly ideal response curve . . . particularly important in client room applications where color quality is critical.

CATV OPERATORS find the RX-4B/VT-4BU an excellent choice for off-air UHF pick-ups and for measurements of systems performance.

Separate visual and aural IF strips, unique trapping circuitry to eliminate the possibility of 920 kHz beats, low differential phase and gain characteristics, standard receiver envelope delay response are a few of the performance features.

And, of course, there's the overall operational stability which results from DYNAIR's high-quality and solid-state reliability. Conservative design, liberal use of integrated circuitry and glass-epoxy etched boards make it so.

Write today for complete details to home office or eastern region office — P. O. Box 17342, Dulles International Airport, Washington, D. C. 20041; telephone (703) 471-4078.



VT-4BU
Plug-in UHF
Tuner

VT-4B-1 Plug-in
Variable VHF/UHF Tuner

FT-4B Plug-in
Fixed VHF Tuner

PRICES:

VT-4BU Tuner	$ 300.00
RX-4B/VT-4BU	1750.00
RX-4B/FT-4B	1820.00
RX-4B/VT-4B-1	1720.00
Optional Chopper (CK-4B)	150.00

Also available for export standards.

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There are plenty of options in tape recorders available as this month's cover suggests. Tape reels were made available to Art Director Sauter, by 3M.

BROADBAND INFORMATION SERVICES, INC.
274 Madison Ave.
New York, N.Y. 10016
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BPA
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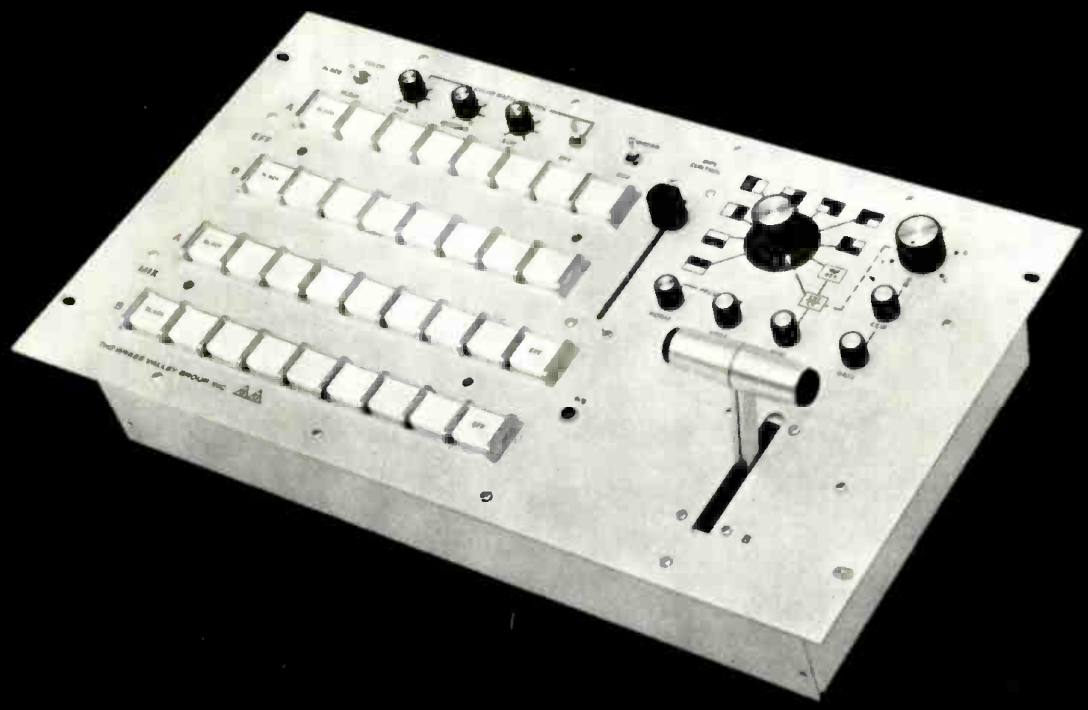

MODEL 1400-12 VIDEO SWITCHER

PROFESSIONAL PERFORMANCE IN SMALL FORMAT

With over 100 switchers now in service, the reputation of Grass Valley Group's Model 1400-12 switching system is now firmly established. The switcher provides the same type of features you expect in a high-quality studio system. For example: Clamped vertical interval switching, remote controlled matrix, internal/external keying and matte, bordered wipe patterns, and accurate color timing.

Available options include chroma key, color black/matte generator, Borderline, non-sync inhibit, automatic sync-add inputs, and an AFV system. Model 1400-12 is available in NTSC, PAL, and PAL-M versions.

For additional information, call or write the Grass Valley Group, Inc.

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BROADCAST INDUSTRY NEWS

TV News, Inc., Will Operate Via Satellite To Earth Station At Each Subscriber

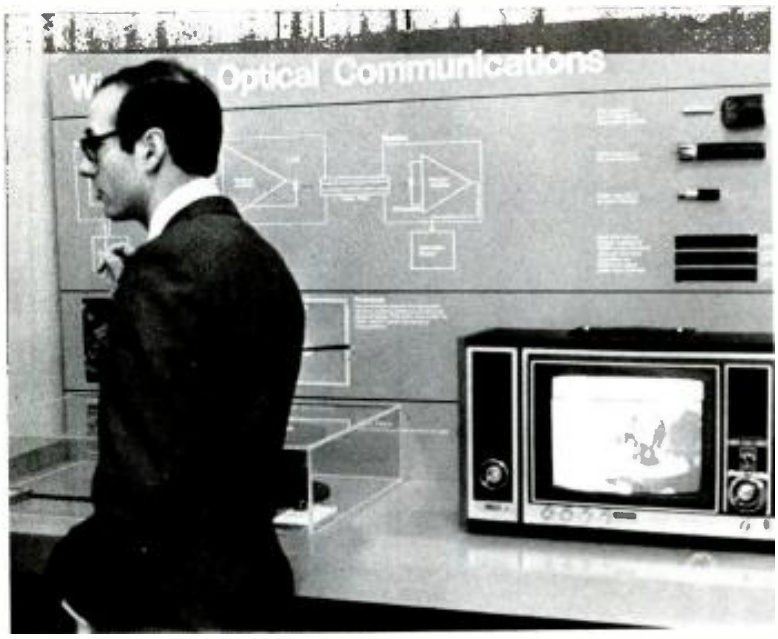
Giving every indication of a strong reconstitution after its recently publicized difficulties, Television News, Inc., independent news-gathering agency, announced in New York in mid-January a break-through plan, with large implications for TV program dissemination in general, for using satellite transmission to an individual earth station at each subscriber to the news service. The plan appeared to be well advanced, with TvN Inc. in process of choosing a supplier for the earth stations and Western Union, whose Westar satellite will be used, joining in the announcement.

TvN, Inc., also announced the equipping of their New York and Washington news bureaus with full facilities for video program origination; enlargement of the news staffs at both locations; and early expansion of the news coverage from the present one hour per day to several hours daily. In answer to questions from newsmen, Jack G. Wilson, president, and other officers of the company said that 36 stations had already contracted for the satellite delivery system, and negotiations were underway with a number of others. The company plans to have about 20 earth stations installed by July 1st of this year, and a total of 75 earth stations by the end of 1975.

Each earth station will eventually be owned by the broadcaster installing it and will be available for receiving other satellite transmissions—there is no restriction to the TvN service. Western Union representatives said that tariffs for the service, then in process of development, would be aimed to make it less expensive than other delivery services, either land-hop microwave or cable. The saving, the spokesmen indicated, should make the purchase of the earth station "cost effective" within a reasonable period.

Some general parameters given for the earth stations were: cost, very roughly $100,000 each; installed weight, 10,000 to 15,000 pounds; electronics and controls can be put under the antenna, or remotely within a control room; aside from severe icing of the antenna (preventable by deicing equipment), weather would be no problem; reliability of overall system generally better, and signal degradation lower, than with multihop microwave or cable systems, because far less equipment is involved.

Wideband Optical Communications



Among the exhibits at the SMPTE 116th Technical Conference at Toronto was this exhibit by Northern Bell showing how TV could be transmitted via a fibre optics system.

Rich Program Announced For Montreux Symposium

Program of the International Television Symposium and Technical Exhibition set for Montreux, Switzerland, May 23rd through 29th of this year, covers an extremely wide spectrum of vital technical and management subjects, according to plans announced as this issue went to press. Among the major sessions are: a round table conference on future technologies and techniques; another titled "Dialog between manufacturers and users on future evolution of video equipment"; and an address by R. J. Clayton, Technical Director for GE of Great Britain, on "Television Broadcasting from Satellites." More than twenty other major topics will be covered in the technical sessions. A few are: automation; digital transmission; fibre tv transmission; image sensors; organs or conversion; special techniques. Speakers and participants in the panels include managers and technical directors of television manufacturing and broadcasting companies from all of Western Europe, the US, Canada, Japan, the USSR, South Africa.

As announced in the December issue, BM/E has again organized a group tour to the Symposium, with a fee that includes transportation, registration, stay at a first-class hotel, with provisions for side trips. For information: write or call International TV Tour, BM/E, 274 Madison Ave-

continued on page 8

New Sony U-matic news team... from action to broadcast in 30 minutes.

Or even less time. With less equipment. And at less total cost than you're probably paying now for news-gathering and teleproduction.

The major networks, ABC, CBS, and NBC, and many stations nationally are using the new Sony U-matic VO-3800/2850 Videocassette System.

All your work is done on economical, reusable videocassettes. After location taping, either microwave the signals or send the cassette to the studio for quick and accurate editing. Or go right on the air with the use of a time base corrector.

You eliminate film cost and processing time, especially when important events break close to air-time deadlines.

You start with the Sony VO-3800 portable VideoRanger™ recorder and a color camera, such as the Sony hand-held DXC-1600. The VO-3800 can record three 20-minute cassettes on a single battery charge. It has NTSC color and EIA monochrome standard signals, remote control, two separate audio tracks, automatic power shut-off, and on-the-scene playback capability.

Accurate electronic editing is achieved with two Sony VO-2850 mastering recorder/editors and the Sony RM-400 Remote Automatic Editing Controller. The RM-400 provides search, pause, and automatic back-spacing. The VO-2850 has a signal-to-noise ratio in excess of 45 dB for video and audio, also separate editing capability for video and two audio tracks.

Of course, the VO-3800 portable VideoRanger™ or the VO-2850 editor can be used independently of each other. In addition to electronic news gathering, these versatile new videocassette units can add new capability and economy in production of documentaries, on-site retail spots, and general studio use.

For complete information and/or a demonstration write us today.
Sony Corporation of America
Video Products Dept. BME-025-210
9 West 57th Street
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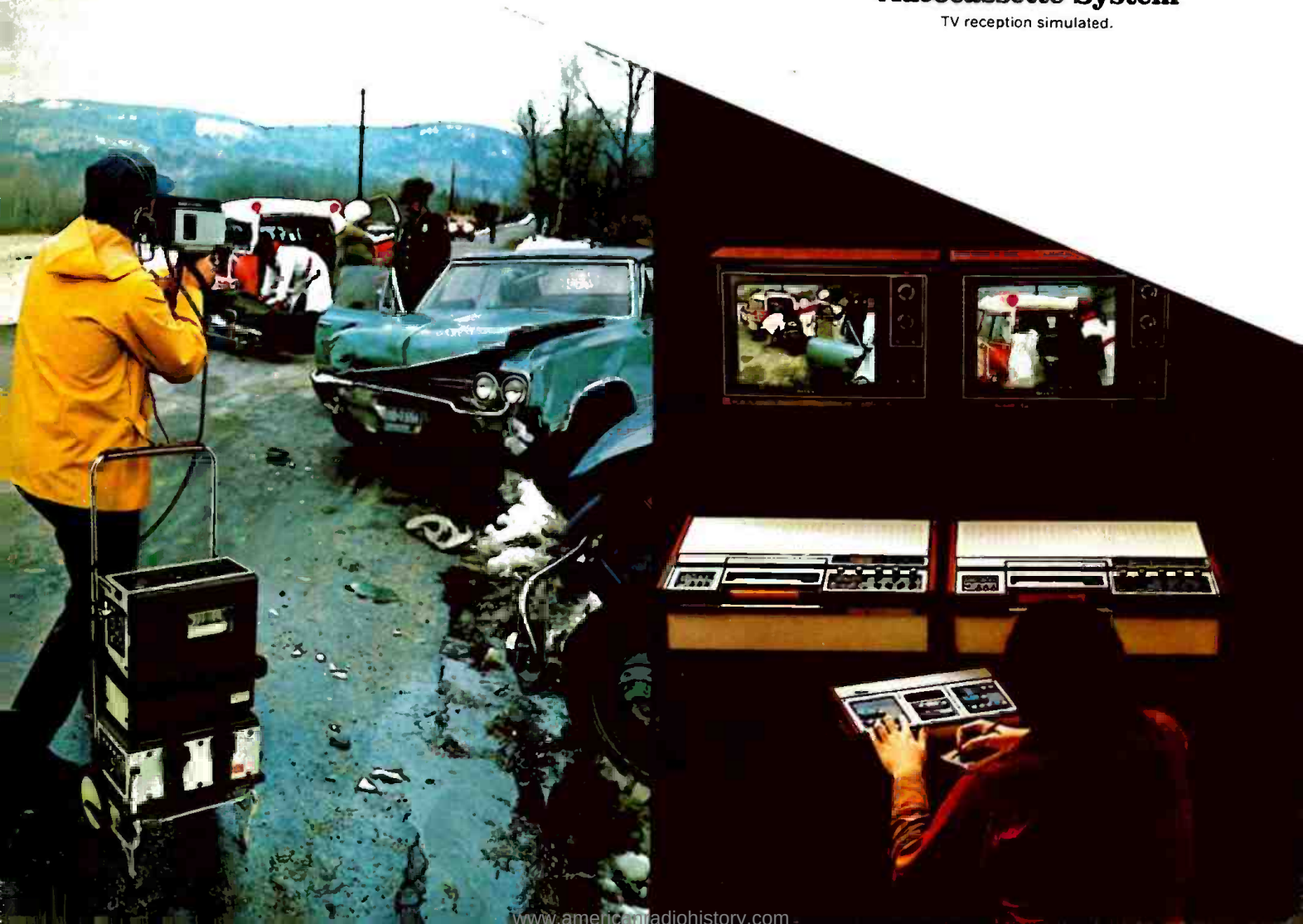
Sony. The proven one!

Sony U-matic Color Videocassette System

TV reception simulated.



NEWS

nue, New York 10016, tel. 212-685-5320.

CCA Sold To New Group; Bernard Wise Resigns

CCA Electronics Corporation, maker of radio and TV broadcast transmitters, automation equipment, and studio equipment, has been sold to a group of investors, according to an announcement from the company. Included in the sale is the controlling interest of Bernard Wise, president and founder, who has resigned as an officer and director of the company. New co-chief executive officers, at the time of the announcement, were Bruce Emonson and Jean-Paul Renoir.

Reuters Announces Retrieval System For Cable TV Subscribers

A new, high-speed information retrieval system capable of serving the investment community and the cable TV viewers at home was announced late in December by Reuters.

Called the IDR system—after the Reuter subsidiary set up to develop it—it utilizes the high-speed transmission capacity of coaxial cable along with television and computer technology to make retrieval services available to a wide variety of subscribers. Fast access time of about 2 ½ seconds is possible.

The system is already operating on channel 26 of Manhattan Cable Television, Inc., which serves a great many commercial buildings in the midtown area and financial district in New York City.

Gerald Long, Managing Director of Reuters, described the system as "in effect permanently delivering to a display terminal the answer to almost any question most people would be likely to ask of a news service."

The central computer continuously retransmits the entire information file every few seconds. The transmission is one way. The subscribers' equipment allows him to "capture" and hold on his video screen the information as it flows through the cable at high speed. Initially the system is being used to deliver information from Reuters' existing specialized services to the investment and banking communities, but long added that "about a year from now we plan to take it into the home, using that electronic display termi-

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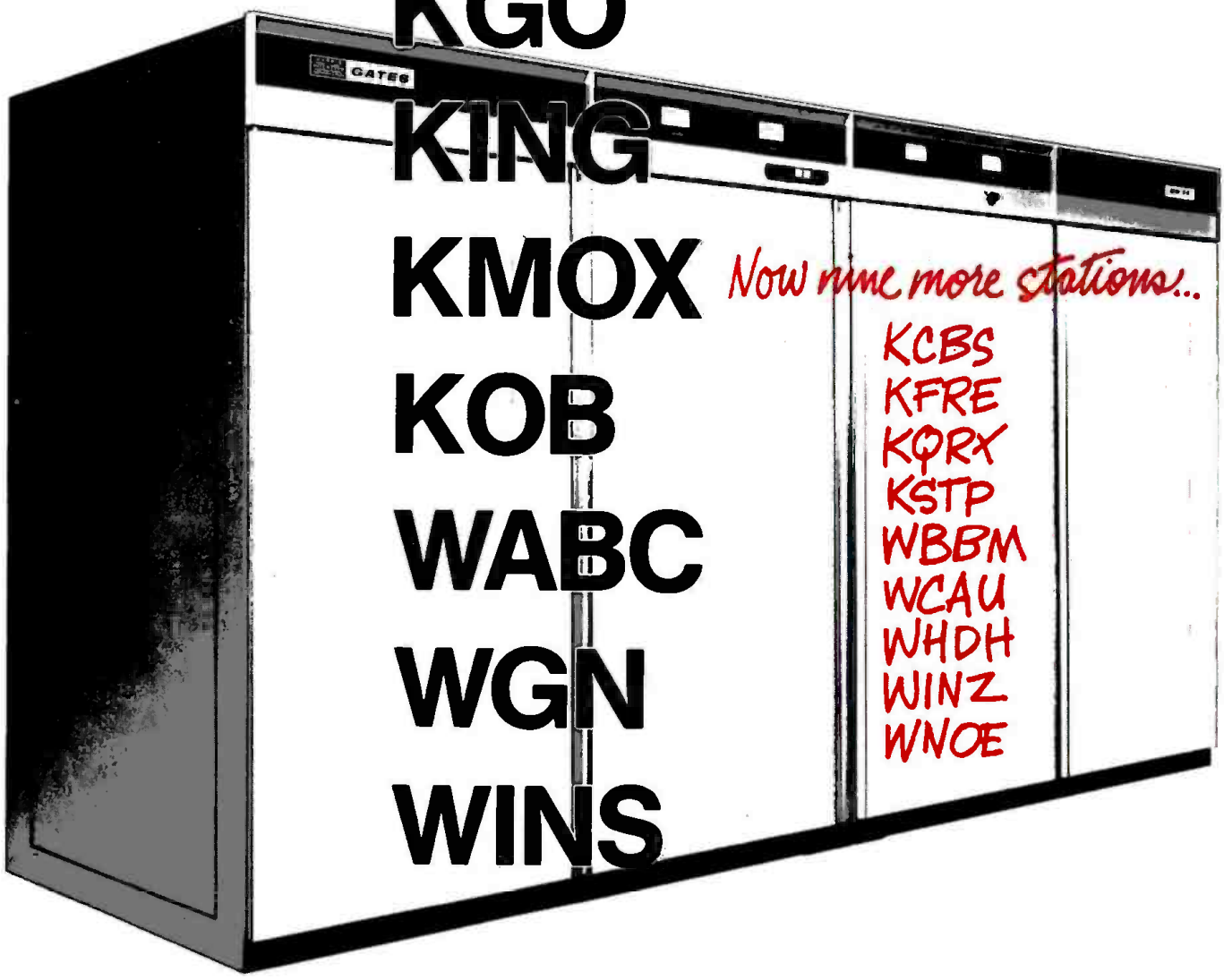
KDKA
KGO
KING
KMOX
KOB
WABC
WGN
WINS



Harris' 50,000-watt MW-50 keeps some very fine company

The pace-setting AM stations listed above are now broadcasting, or soon will be, with Harris' MW-50, 50 kilowatt PDM (Pulse Duration Modulator) transmitters. With good reason.

The MW-50 signal is strong and clear—backed by a 125% positive peak modulation capability that allows higher average modulation levels.

Overall transmitter efficiency is greater than 60%! And the MW-50 employs only five tubes (just three tube types). Compact design saves space, simplifies installation.

Find out why the MW-50 is at home in so many of the country's top stations. Write Harris Corporation, Broadcast Equipment Division, 123 Hampshire Street, Quincy, Illinois 62301.

HARRIS COMMUNICATIONS AND INFORMATION HANDLING

Circle 104 on Reader Service Card

NEWS

nal that is sitting in everyone's living room—the television set."

In addition, Manhattan Cable has started marketing special services based on the IDR system to investors and racing enthusiasts. (Manhattan Cable currently has 60,000 subscribers). Outside of New York City Reuters has signed or is negotiating similar agreements with other carriers. Development of a mass market requires the availability of a low cost terminal. Present terminal costs $275. This can drop to $25-$35 in mass quantities.

Because coaxial cable is used, transmission of data is at a much higher speed than on conventional telephone lines. Rate is five million bits per second, or about 70,000 words a second. The information bank demonstrated containing commodity and money rates data contains about 300,000 words at any one time.

Consortium Will Push For "Public Sector" Satellite Services

The success of the ATF-6 satellite experiments (BM/E November) has encouraged a large group of users and potential users in health, education, government, and other parts of the "public sector" to join forces for a strong effort to establish regular satellite services for such users. At meetings held in November and December, a "Public Service Satellite Consortium" was organized, charged with finding and getting the support of potential users; promoting the technical development of the needed satellite systems; coordinating the telecommunications planning of public groups and offering them technical assistance; acting as "group agent" for public users, to get low-cost bulk services for them; and seeking financing to help in the program. The Consortium will not deal with programming as such. Additional meetings are set for February 19-21, at San Diego State University.

Among organizations acting as founding members of the Consortium are: the Federation of Rocky Mountain States; the State of Alaska, Telecommunications Department; the Corporation for Public Broadcasting; National Public Radio; Mountain States Regional Medical Program. Chairman is H. Rex Lee, former FCC Commissioner and now Visiting Professor at San

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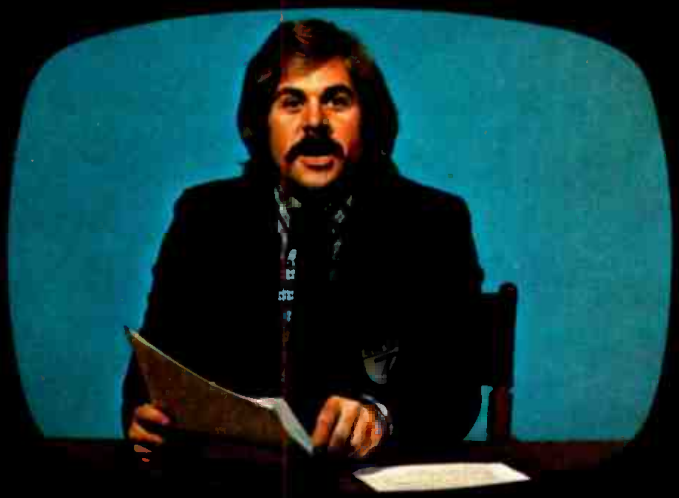
The 10:10 knockout on the 11 o'clock news: Channel 7.



"...we expect to have a filmed report for you later on."

The 10:10 knockout on the 11 o'clock news: Channel 4.

The Akai VTS-150. It can make the difference between news you can only talk about and news you can show.

Ray Karpowicz, General Manager KSD-TV "One afternoon the Fairmont Racetrack in Illinois burned to the ground and KSD sent a crew out in a helicopter. Over the site, we moved slowly as possible and held the Akai VTS-150 to our chest to reduce vibration. The system worked to perfection and we had the story on at 6 o'clock."

Steve Currie, Director of Broadcasting WCBD-TV "When Gen. Alexander Haig visited "The Citadel" in South Carolina, his press conference began at 4:30 P.M. We took an Akai VTS-150 with us and returned in plenty of time with the story edited and ready to be televised on our 6:00 P.M. News."

Ray Miller, News Director KPRC-TV "The prison break attempt in Huntsville occurred in late afternoon nearly 100 miles from Houston. We flew the Akai to Huntsville, got some pictures, talked to a prison official, and got back to Houston in time for our 6:00 P.M. News."

The VTS-150. It weighs only 22 pounds. It costs only $6995. It can go anywhere. Shoot anything. Edit anything. In minutes. Ready for airing. We think it's revolutionizing broadcast journalism. Just watch.

AKAI™

People watch the news to see the news.

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Simulated television reception

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Diego State University. Additional data can be had from the Executive Secretary, F. W. Norwood, Joint Council on Educational Telecommunications, 1126—16th St., N.W., Washington, D.C.

FCC Approves SDS Pay TV System

In late November the Federal Communications Commissio approved the pay TV system of System Development Corporation, Santa Monica, California, the fourth scramble-unscramble system to get the Commission's nod.

Jointly developed by SDC and Pay TV Corporation of New York, the system will be marketed by the two firms for use by others starting early in 1975. Pay TV Corp. may in addition operate some over-the-air systems of its own. System Development Corp. was negotiating with hardware suppliers as this was written.

The other three pay TV systems approved to date are: Zenith's "Phonevision;" Blonder-Tongue's "BTVision;" and Teleglobe's "Number 410." Blonder-Tongue was the first on the air with a full-scale test of a pay TV system, starting in October, 1974, with their own station, WBTB, Channel 68, in Newark, N.J.

First FM Channels Go To Eleven Communities

The Federal Communications Commission has amended the table of FM assignments to give eleven communities their first FM channels. In each case the petitioner for the change has announced an intention to apply for the channel. Included are: Fairfield, Iowa; Maysville, N. Dak.; Eldon, Mo.; Crete, Neb.; Hurricane, W. Va.; Patterson, N.Y.; Sauk Center, Minn.; Appomatox, Va.; Warren, Ark.; Gatesville, Texas; and Otsego, Mich.

TV Remote Control Inspection Reduced To Once Weekly

The Commission has changed its rules to reduce the requirement for inspection, calibration and testing of television remote control equipment and transmitters from five days a week to once each week. The new rule, which went into effect December 30, 1974, will bring the TV remote control inspection requirements into line with those for AM and FM radio stations, the FCC pointed out.

Two-Tone EBS Interstation Signals Approved by FCC

Acting on a recommendation of a National Industry Advisory Committee, the Commission has adopted a two-tone attention signal for interstation alerting in the Emergency Broadcast System. This new signal will replace, on January 15, 1976, the current attention signal which consists of two five-second breaks, followed by a 1000-Hz tone for 15 seconds. The FCC said that the possibilities for misunderstanding with the present signal, plus the advance of the art which has made two-tone generating equipment less expensive and more reliable, led to the change in the prescribed signal.

New Rules For Changes In FM, TV Assignments

Organizations and individuals petitioning for a change in the table of FM or TV assignments now have the responsibility for sending copies of the petition to licensees or permittees who may be affected by the proposed change, under new rules adopted by the Commission, effective December 20, 1974. Aiming to speed action on such petitions, the new rule elimi-

continued on page 14

Today, More Than Ever...

DITCH WITCH MODULARMATICS Make $ense!

One piece of equipment for a variety of underground job requirements — that's what the Ditch Witch Modularmatic concept is all about. Interchangeable modules can equip Modularmatic vehicles to perform up to 11 different underground and related job assignments. And since one machine can do more, overall equipment costs are obviously reduced. You get more for your equipment dollar and you get more equipment potential and flexibility. There are four Modularmatic models to choose from, in power ranges from 30-HP to 100-HP. You also have a choice of power plants — gasoline or diesel. Modules allow you to equip your basic vehicles for selected trenching requirements, restoration, vibratory plowing, combination trenching and plowing capability, backhoe work, loading, horizontal boring and pavement breaking work. Buy the Modularmatic vehicle and modules you need now; add other modules as needed. Today, it's more important than ever to get the most for your money. And, that's why, today, the Modularmatics make more sense than ever!

Ditch Witch . . . equipment from 7· to 195-HP.

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NEWS

nates the earlier two-tier proceeding in which the FCC, after receipt and preliminary acknowledgement of the petition, notified others who would be affected and invited comments, and does the same again in a later notice of proposed rule-making. Also under the new rule, parties opposing the proposal must submit counter-proposals with their initial comments. The changes were adopted in response to recommendations on the subject by Joint Re-Regulation Committee of the Federal Communications Bar Association and the Communications.

Cable Franchisors Must Set Up Complaint Procedure

Local franchising authorities granting cable franchises after August 1, 1975, must set up procedures for handling customer complaints about service, and must designate an official or office to receive complaints, under amended rules recently adopted by the Commission. The rules had previously included a provision that a cable franchise must include "procedures for investigation and resolution of all complaints regarding the quality of service . . . ." The FCC, announcing the amendment, said the intent was to clarify the intent of this rule, which should impose the obligation on the franchising authority as well as on the cable operator.

EIA Submits Report to FCC on Rules and Regulations for Unattended TV Transmitters

The Broadcast Equipment Section of the Communications Division, Electronic Industries Association, has submitted a report to the FCC supporting the position for revised unattended operation of television broadcast transmitting systems. The report, "Toward Rules and Regulations for Unattended TV Transmitters," also affirms the feasibility of systems for unattended operation using current technology and readily available equipment.

The report, prepared by the Communications Division's TR-4.1 Engineering Subcommittee on Television Broadcast Transmitters, makes spe-

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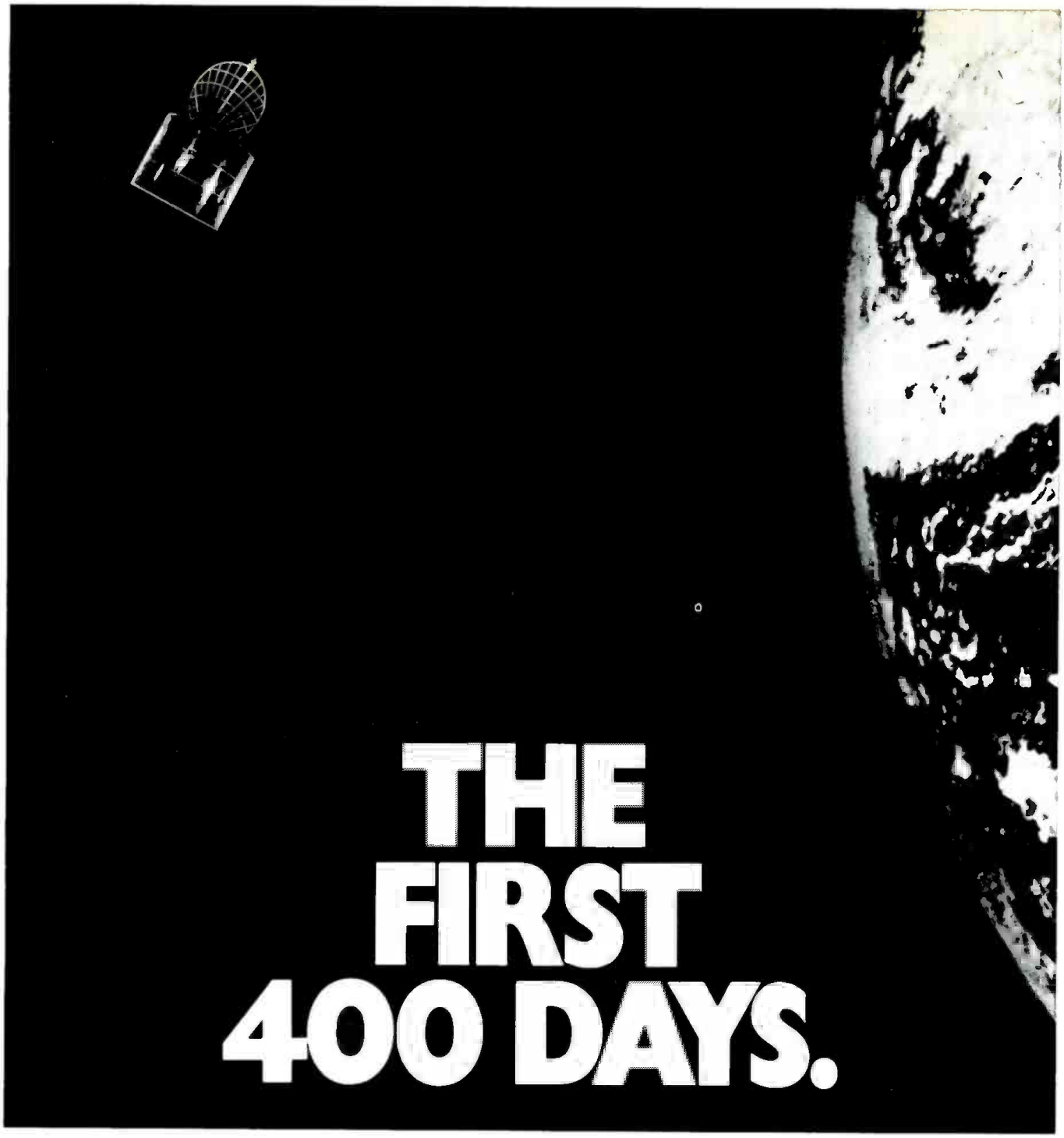


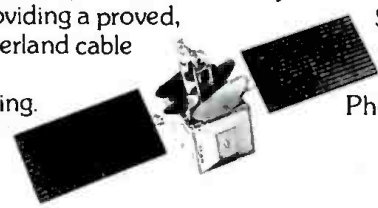
A progress report on the RCA Satcom System. America's first operational domestic communications satellite system.

On December 21, 1973, RCA Globcom's Satcom System became operational and substantially reduced the cost of coast-to-coast communications.

Today, the Satcom System's private, voice-grade leased channels are providing a proved, cost-effective alternative to overland cable and microwave circuits.

This is only the beginning.

Later this year, RCA Satcom Phase II will begin with new earth stations, an advanced design, high-capacity satellite (shown below), and extended service to the entire United States. This service will include applications for TV and CATV transmission, full transponder systems and special services for government and industry.



For information on how the RCA Satcom System can benefit your company, contact Satcom Marketing, RCA Global Communications, Inc., 60 Broad Street, New York, New York 10004. Phone: (212) 363-3986.

RCA Global Communications

Circle 112 on Reader Service Card

cific recommendations regarding what features, characteristics, and rules should be required to insure that licensees will implement and operate a station with an unattended transmitter plant. The recommendations include: a feature to test the automatic shut-down circuits; a requirement for automatic control of aural and visual modulation levels; a requirement to automatically shut down the transmitter if the carrier frequency error or the maximum power output exceeds the tolerance set by the rules; the singling out of seven TV transmitter system performance parameters that should be electronically monitored.

NCTA Adopts Resolution Against Proposed FCC Pay Cable Rules

The National Cable Television Association Board of Directors has adopted a resolution which criticizes expected FCC regulations covering pay cable TV. The NCTA Board acknowledges that the FCC has not yet formally issued the new rules. The resolution states that 'contrary to its own statutory mandate, the FCC seems unwilling to permit the full development of innovative communications services desired by the public where it is alleged those services might be competing with the established order.' . . . The FCC, continued the NCTA resolution, appears to have created an illusion of meaningful relief. We believe, however, that the FCC's program only strengthens broadcasting's hold on the means of distributing programming to the American public.

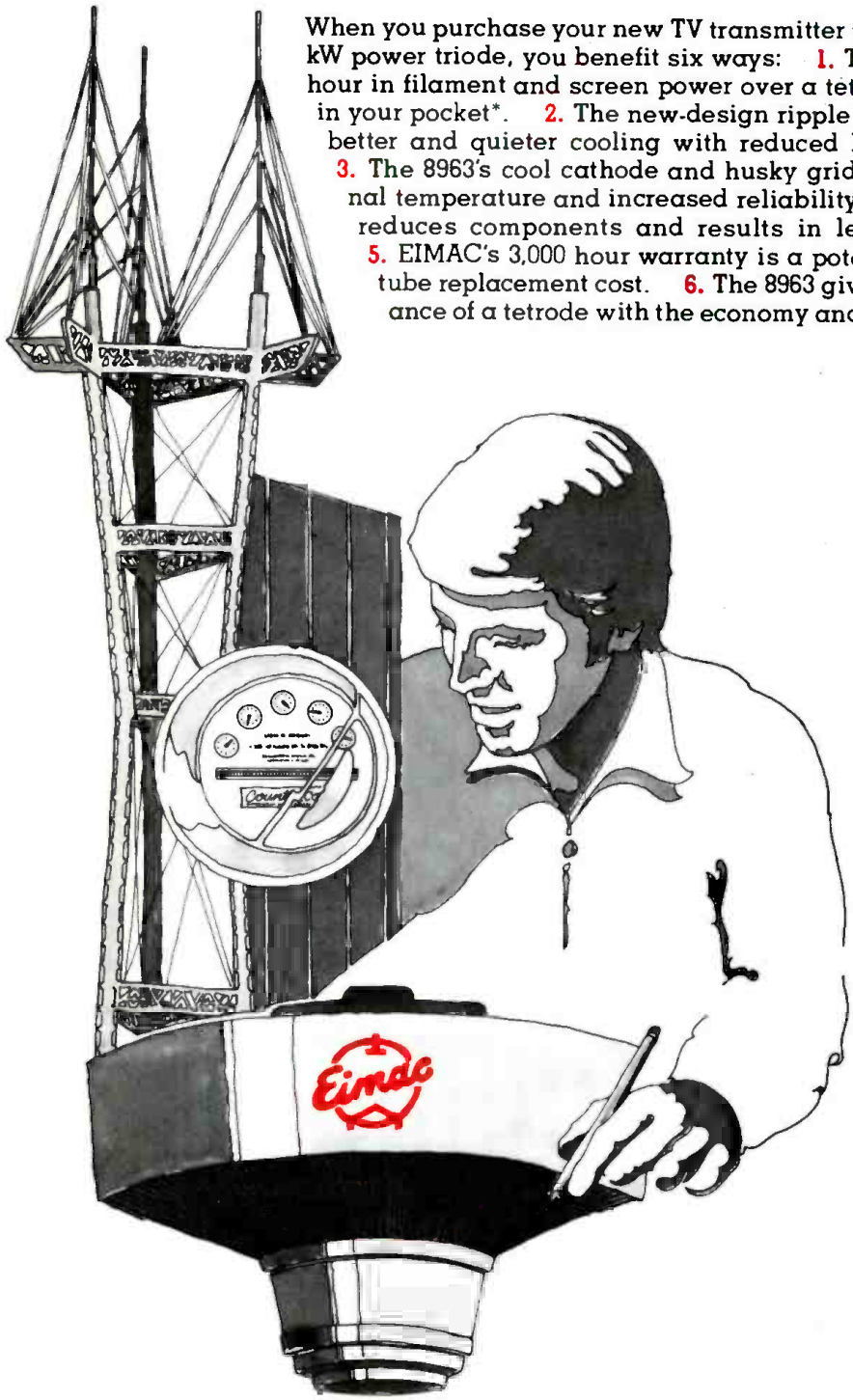
NAB President Takes Aim at Pay Cable

In a speech presented to the Arizona Broadcasters Association, National Association of Broadcasters President Vincent T. Wasilewski declared that "the time has come for some plain talk about the National Cable Television Association and the pay-cable entrepreneurs it represents." The NAB president traced previous cable interest positions such as in-home educational, medical and shopping services and minority programming, to the NCTA's present efforts.

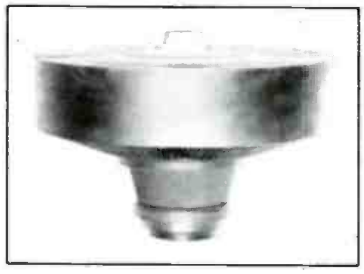
continued on page 18

TV Station Executives...

EIMAC's 1975-model 8963 TV triode saves you money six ways.



When you purchase your new TV transmitter with EIMAC's 8963 the new 25 kW power triode, you benefit six ways: 1. The 8963 saves 1200 watts per hour in filament and screen power over a tetrode. That's over $250 a year in your pocket*. 2. The new-design ripple fin radiator of the 8963 gives better and quieter cooling with reduced blower power requirements. 3. The 8963's cool cathode and husky grid structure mean lower internal temperature and increased reliability. 4. Simple triode circuitry reduces components and results in less downtime and failures. 5. EIMAC's 3,000 hour warranty is a potential savings on tomorrow's tube replacement cost. 6. The 8963 gives you the gain and performance of a tetrode with the economy and circuit stability of a triode.



Put dollars in your pocket and enjoy improved transmitter reliability with the EIMAC 8963. For complete details, ask your TV equipment distributor or write EIMAC, Division of Varian, 301 Industrial Way, San Carlos, California 94070. Or contact any of the more than 30 Varian/EIMAC Electron Device Group Sales Offices throughout the world.

Eimac®
division
varian

*Based on an 18 hour transmitting day at 3¢ per kWH—and rates are going up (Business Week, Oct. 5, 1974).

Circle 115 on Reader Service Card

NEWS

Mr. Wasilewski emphasized that radio has much to lose if pay cable achieves its goals, since radio would be "excluded from sports coverage under pay-TV's grand plan." He said cable's present position was best put in focus by Geoffrey Nathanson, head of a pay cable firm, in commenting on the FCC's 1972 rules to implement the "consensus agreement." At that time, he said, Mr. Nathanson was quoted as saying: " 'The wraps are off. What we're really talking about is pay-TV, here and now, this year. We used to bury it and talk about meter-reading and education for the kids and two-way communications, and all the rest . . . But let's face it—we're really talking about the potential of first-run movies and Super Bowls on a pay basis.' "

Mike Award Honors Loudspeaker Inventor

The Maker Of The Microphone Award for 1974 has been presented to Edgar Villchur for his work on the acoustic suspension loudspeaker. The engraved plaque was presented by Oliver Berliner, Audio-Video expert and grandson of Emile Berliner, inventor of the disc record and player. The award is presented annually for "an outstanding contribution to the world of sound." The award will be awarded only 25 times, symbolizing the fact that Emile Berliner was 25 years old when he invented the telephone microphone.

Church Helps Community Groups Organize for Better Programming, Employment Opportunities

A national program, sponsored by the Office of Communication of the United Church of Christ, helps community organizations seek better television and radio programming, fair employment in broadcasting stations, and attention to the needs of minorities. The program, has enlisted the aid of the FCC, broadcasting industry figures, education and civil rights groups, and foundation support.

The project, called "Check Your Local Stations," is intended to arouse viewers to the need to take a

continued on page 69

For those who don't already know it, besides manufacturing color and monochrome television cameras for a variety of end-user markets for nearly a quarter century, Cohu also produces a broad line of Studio Processing Equipment including—Sync Generators • Dot Bar Generators • Pulse Distribution Amplifiers • Video Distribution Amplifiers • Subcarrier Distribution Amplifiers • Video Encoders • Encoder Enhancers and Video Switchers

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Circle 117 on Reader Service Card

Now, triax color with one little difference:

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THOMSON-CSF TTV 1515, Now used in CBS mobile units

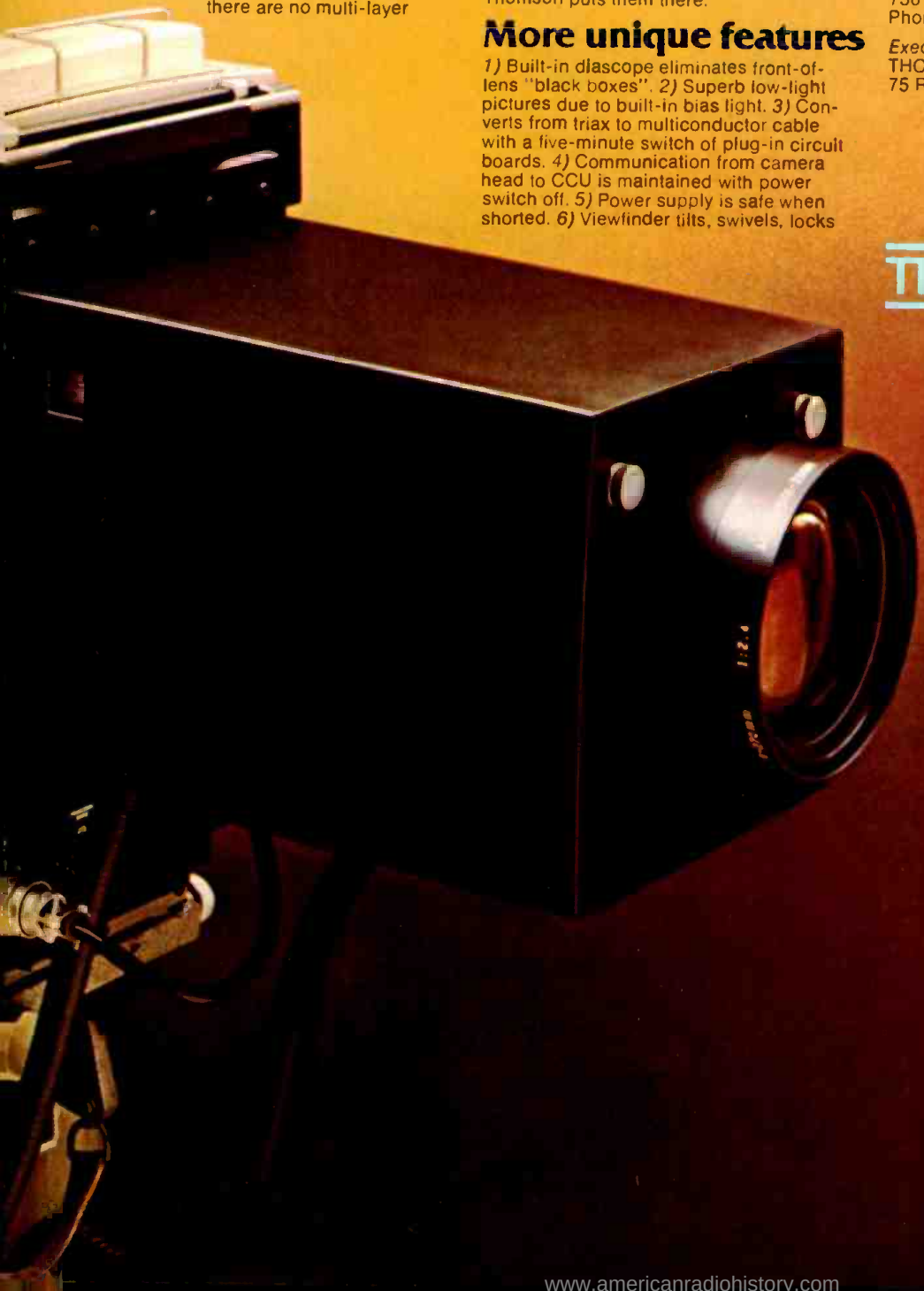
Triax color cameras have promised you enormous savings in man-hours and cable costs. But it takes a really reliable camera to turn those savings into a practical reality. Now there is one.

The TTV 1515 has been delivering trouble-free service in the field ever since 1971. Over 300 are now in use. It's the triax color camera that proved it works.

Why it works

Thomson patents on circuits on this camera go back to 1964. We've been perfecting it ever since. The TTV 1515 wasn't introduced until every last "bug" had been thoroughly eliminated.

We also made 99% of maintenance a matter of minutes. Nearly all circuitry is in plug-in circuit boards . . . changed or adjusted instantly, 100% solid state. And there are no multi-layer circuits to frustrate maintenance technicians. All wiring is in the open.



Quietest picture yet

Perfected pre-amplifier designs advanced processing and contouring techniques, and the adjustable comb filter all cut noise. Time-proved 30 mm. separate-mesh tubes are mounted parallel to the optical axis. Head amplifiers surround the targets for full shielding. Result: to an exceptional degree, noise is eliminated at the source.

The thinking man's CCU

A real miniature sync generator is built into the CCU for automatic syncronization. It restores, from mixed sync only, all signals usually derived from external sync . . . blanking, drives, etc.

Also built into the CCU: contour correction, adjustable comb filter, color masking, amplitude modulated shading, automatic cable compensation. All these logically belong in the CCU (not the camera). Thomson puts them there.

More unique features

1) Built-in diascope eliminates front-of-lens "black boxes". *2)* Superb low-light pictures due to built-in bias light. *3)* Converts from triax to multiconductor cable with a five-minute switch of plug-in circuit boards. *4)* Communication from camera head to CCU is maintained with power switch off. *5)* Power supply is safe when shorted. *6)* Viewfinder tilts, swivels, locks and operates remotely. *7)* Portable: camera 77 lbs., viewfinder 11 lbs. *8)* Automatic continuous registration provided by optical markers in the optical assembly. *9)* Ultra-stable digital multiplexing in 46 remote channels. *10)* Separate multiplexed analog RGB outputs: compatible with existing Chroma-Key systems; permit use of NTSC, PAL and SECAM encoders.

Thomson-CSF: Leader in triax color

Since the early 1960's, the facilities of France's largest manufacturer of professional electronic equipment have been hard at work on triax color. Thomson-CSF has over 48,000 employees. The parent corporation, Thomson-Brandt, has over 98,000.

It all adds up to the most perfectly-developed camera in triax color TV. The field-proven one. The successful one. The one that works. TTV 1515 by Thomson-CSF.

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THOMSON-CSF

Circle 116 on Reader Service Card

INTERPRETING THE

FCC RULES & REGULATIONS

Two New CATV Rules

By Frederick W. Ford and Lee G. Lovett
Pittman, Lovett, Ford and Hennessey, Washington, D.C.

1. Access Equipment Availability

The Commission has repealed its mandatory local origination cablecasting rule[1] which was applicable to all cable television systems with 3,500 or more subscribers. The Commission based the action upon its conclusion that mandatory origination was not the most effective means of fostering local expression in programming.

Origination by cable operators is now strictly voluntary. Local franchising authorities may continue to require provision of an origination channel by the franchisee, but may not dictate the manner of operation of that channel.

Cablecast Equipment Availability Rule

Instead of mandatory origination, all cable systems with 3,500 or more subscribers, and all

> conglomerate[s] of commonly owned and technically integrated systems having a total of 3500 or more subscribers [must make equipment available] for local production and presentation of cablecast programs other than automated services and permit local non-operator production and presentation of such programs.[2]

A cable system or conglomerate serving 3,500 or more subscribers must comply with the new rule even if it was granted a waiver of the former mandatory origination rule.

Although hesitant to detail what types of equipment would be adequate to comply with the rule, the Commission outlined the following "minimum":

> ... the operator must have at least the capacity to afford live programming with one or more black and white cameras, the capacity to video tape remote programs, edit, and play them back, and the capacity to modulate the resulting video and audio product on a cable channel.

"Minimum" compliance with the cablecast equipment availability rule is estimated (by the Commission) at under $10,000 with annual equipment maintenance costs of less than $1,000.

Top 100 Market CATV's Not Affected

Cable systems located, in part or in whole, within the top 100 television markets must, *inter alia*, provide designated access channels[3] pursuant to Section

continued on page 26

This column periodically reviews important new CATV rules adopted by the Commission. A recent flurry of CATV rule additions, modifications and deletions prompts discussion of two important such rules.

[1] Section 76.201 of the Commission's Rules is repealed effective January 20, 1975. (Note that this Rule's effectiveness has been "stayed" by the Commission since May 27, 1971.)
[2] Section 76.253 is effective (1) on January 1, 1976, or (2) on the date that cablecast equipment is made available, if before then.
[3] These include Public Access, Government and Education channels. The Public Access channel must be made available on a nondiscriminatory, first-come basis and minimal equipment and facilities necessary for program production must be available for public use.

PEC-102

A Complete System Approach to Computer Controlled VTR Editing... by Central Dynamics

A frame-accurate editor for creative people, designed for your present and future requirements . . . with outstanding features including:

- Mimic CRT diagrams for Off-Line and On-Line edit modes graphically display current status of all operations including data entry, scene location, edit rehearsals, and automatic assembly.
- A control panel designed for the editor.
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- Edits on any frame . . . with accurate color framing.
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- Edit-on-the-Fly.
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- Automatic control of audio/video switcher with full Mix/Effects capability.
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The PEC-102 is an example of our "Total Design and Manufacturing Approach" to video tape editing systems . . . Hardware, Software and Service . . . all by Central Dynamics.

If you need more convincing, send for our PEC-102 and editing equipment brochures, or ask to see the PEC-102 in action. They are operating in most major cities across the country.

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Picture a new high performance,

One picture couldn't begin to tell the whole story of how our new TR-600 compares with other "new" VTR's.

Nor would a hundred.

But, we felt that a number of different views would give you a good idea of what we mean when we say totally new tape technology.

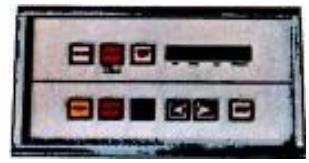
Like the drop-on reels for instance.

Then there's our unique straight line threading. It not only speeds loading, but once the tape reaches the take-up reel, the operator is also assured that threading has been accomplished properly.

The TR-600 utilizes a standard headwheel (featuring long-life Alfecon II poletip material) that's compatible with all other RCA highband recorders. You'll find this really keeps down the expense of spares.

tape technology, medium price.

We've added an electronic LED readout tape timer. And LED diagnostic indicators.

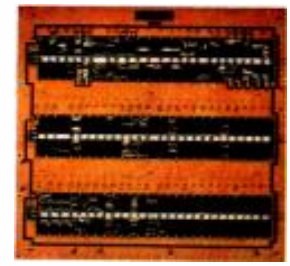


At the first sign of certain malfunctions or nonstandard modes, a control panel light flashes a warning, while individual lights inside direct you to the module that's in question.

We've simplified the control panel for easy operation.

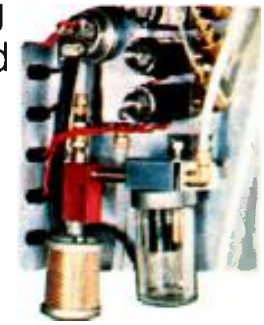
These module cards have the reliability advantages of computer assembly printed circuit wiring and automatic insertion of components.

Another TR-600 innovation is the copper backplane which assures precise resting of modules.



The backplane is wire wrapped under computer control replacing the past practice of using dense, bulky internal wiring harnesses.

Chimney cooling eliminates the need for blowers and a Venturi vacuum system replaces normally noisy vacuum pumps.



And for optimum playback performance our tape tension servo system features fast rewind and is gentle in handling of tape.

Unfortunately, there are so many things we can't show you. Like all the TR-600's automatics. Because they're all built in. Like the splicer, too. Or the fact that its new integrated design reduces the number of components by 40%.

Nor can we show you the time and money the TR-600 will save you.

But, if what we've shown you so far looks good, we'd be glad to send you a more complete picture of the TR-600. Write RCA Broadcast Systems, Bldg. 2-5, Camden, N.J. 08102. Get the picture, then compare.

RCA

cont. from page 22

76.251 of the Commission's Rules, and, therefore, need do nothing more because they already comply with the new cablecast equipment availability rule. Cable systems *not* required to provide a dedicated access channel pursuant to Section 76.251 need not do so now. Yet, such cable systems are expected to make a "reasonable effort" to provide public use of channel time whenever it is available.

"Natural Break" Advertising Rule Repealed

The "natural break" restrictions on origination cablecast advertising[4] is repealed effective January 20, 1975. Henceforth, advertising can be inserted anywhere within an originated cablecast program, instead of only (1) at the beginning, (2) at the end of (3) at natural breaks. The Commission's purpose in eliminating the advertising restriction is to encourage the now voluntary origination programming by cable operators.

Access Equipment And Time Charges

Cable operators may make "reasonable" charges for the use of cablecasting *equipment* that is required to be made available for public access as long as such charges are "consistent with the goal of affording the public with a low cost means of television access." Yet, a cable franchise may still require that no charge be made for such equipment.

No charge may be made for *channel time* for noncommercial programs cablecast by local persons or entities that are not cable operators. Such "non-operator" programming should be identified as such during cablecasting.[5]

Rules Applicable To Operator And Non-Operator Cablecasters

Origination cablecasts under the full control of the operator must comply with Sections 76.205 *et seq.*[6]

Non-operator cablecasters need not comply with these origination cablecasting rules. Moreover, cable operators may exercise no control over program content of non-operator programs, are limited in cost assessments (discussed, *supra*), and must establish operating rules concerning the following:

(1) first-come, nondiscriminatory availability of cablecast equipment;
(2) prohibition of presentation of lottery information and obscene matter;
(3) sponsorship identification;
(4) specification of a rate schedule; and
(5) public inspection of a complete record of names and addresses of all persons or groups requesting use of cablecasting equipment. Such record must be available for inspection for two years.

Cable operators must file the required operating rules with the Commission within 90 days after the access equipment is first made available. Such rules must also be made available in the cable system's public inspection file.

2. Late-Night TV Program Carriage

The Commission recently enacted a rule[7] permitting carriage of late-night programming from otherwise unauthorized stations. The rule is of immediate applicability to operating cable systems. To facilitate the planning of a more attractive and complete programming proposal, both operating and prospective CATV's should have a thorough understanding of the new rule.

Permissible Importations

Without FCC certification or notice to TV stations, CATV's may carry any and all television broadcast signals *from (1)* the sign-off of the *last* television signal that the cable system must carry *until (2)* the sign-on of the *first* television signal that the cable system must carry. The following hypothetical illustrates the new rule.

> A cable system operating in Community X is required to carry 10 television signals by the Commission's Rules. The Rules do not permit carriage of any signals other than the 10 presently carried. Five of the stations sign-off at 12:00 a.m., three sign-off at 12:30 a.m., one signs-off at 1:00 a.m., and the final station signs-off at 1:30 a.m. The cable system may initiate carriage of any and all other television stations at 1:30 a.m. and not before. The system may continue to do so until the first mandated-signal returns to the air.

If a television station, the signal of which is the last required to be carried, signs-off *before* the hour or half hour, a cable system may initiate carriage of any and all other television signals at the preceding half hour or hour respectively.

The following illustration assumes the facts stated in the above hypothetical.

> Of the stations required to be carried by the cable system in Community X, the one signing-off last does so, not at 1:30 a.m., but at 1:15 a.m. The cable system may initiate carriage of any and all other television stations at 1:00 a.m., one-quarter hour *before* the last "required-carriage" station signs-off. If the last "required-carriage" station signs-off at 1:50 a.m., the cable system may initiate carriage of any and all other television stations at 1:30 a.m., twenty minutes *before* sign-off of the final station.

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[4] Section 76.217 of the Commission's Rules.
[5] The Commission recommends identification of (1) a cablecast program as origination cablecasting or access cablecasting, and (2) the person or group presenting the program, until the pending cablecast identification rule making proceeding is completed.
[6] These sections include rules relating to: origination cablecasts by candidates for public office; fairness doctrine; personal attacks; political editorials; obscenity; sponsorship identification; pay cable charges; minimum channel capacity; access channels.
[7] On October 18, 1974, the Commission enacted Sections 76.57(c), 76.59(d) (3) and 76.61(e) (3) of its Rules.

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"...super-reliable low-cost color camera"

says Midwest Teleproductions.

"At under 60 lbs., the TK-355 moves to new camera positions with a quarter the manpower and time of our previous studio-type color cameras. And it's fantastically reliable. Our three Ikegami TK-355's cover all events at the new sports and entertainment center in Northwest Ohio, The Coliseum. With these cameras, it's been zero downtime all the way!

There are plenty of little 'extras' which make the TK-355 a pleasure to use, too. Like velvet-smooth zooming with unique push-pull control . . . and the built-in diascope registration chart for instant emergency set-up and alignment.

No other low-cost color camera we've tested is so portable, so reliable, so easy to use, and delivers such great pictures at moderate lighting levels. Ikegami has really put it all together in the TK-355!"

Len Zaller, Operations Manager
Midwest Teleproductions, Inc.

For further information and/or demonstration, call or write:

IKEGAMI ELECTRONICS INDUSTRIES INC. OF NEW YORK

35-27 31st Street, Long Island City, New York 11106/Telephone: (212) 932-2577

Circle 162 on Reader Service Card

cont. from page 26

Cable systems will be permitted to carry an imported program to its conclusion although a local station has signed-on (an exception to the general rule stated above). The Commission felt that a rule requiring termination of imported stations as soon as the first local station signs-on would be against the public interest. The Commission does require that carriage of any imported signals be consistent with the program exclusivity rules. In most cases, this means simultaneous exclusivity.[8]

Effects On Leapfrogging And Other Issues

The Commission's leapfrogging rule (limiting a cable system's choice of imported independent signals from the first 25 major TV markets) is not applicable to late-night cable system station carriage. Cable system operators may choose any signal in any priority regardless of distance from the cable system's community. *Nor will the Commission require prior certification of the distant signals chosen for carriage.*

No imported late-night programming will be grandfathered to a cable system by the Commission. Thus, local late-night broadcasting will be encouraged by giving local stations the power to terminate late-night signal importation by extention of their own programming day.

Finally, the Commission made clear that it was *not* ruling on several issues, including:

(1) "videotaping programs for late-night replay";
(2) imposition of "more stringent logging requirements" on cable systems; and
(3) "requiring retransmission consent."

Consideration of these issues may be the subject of future Commission proceedings.

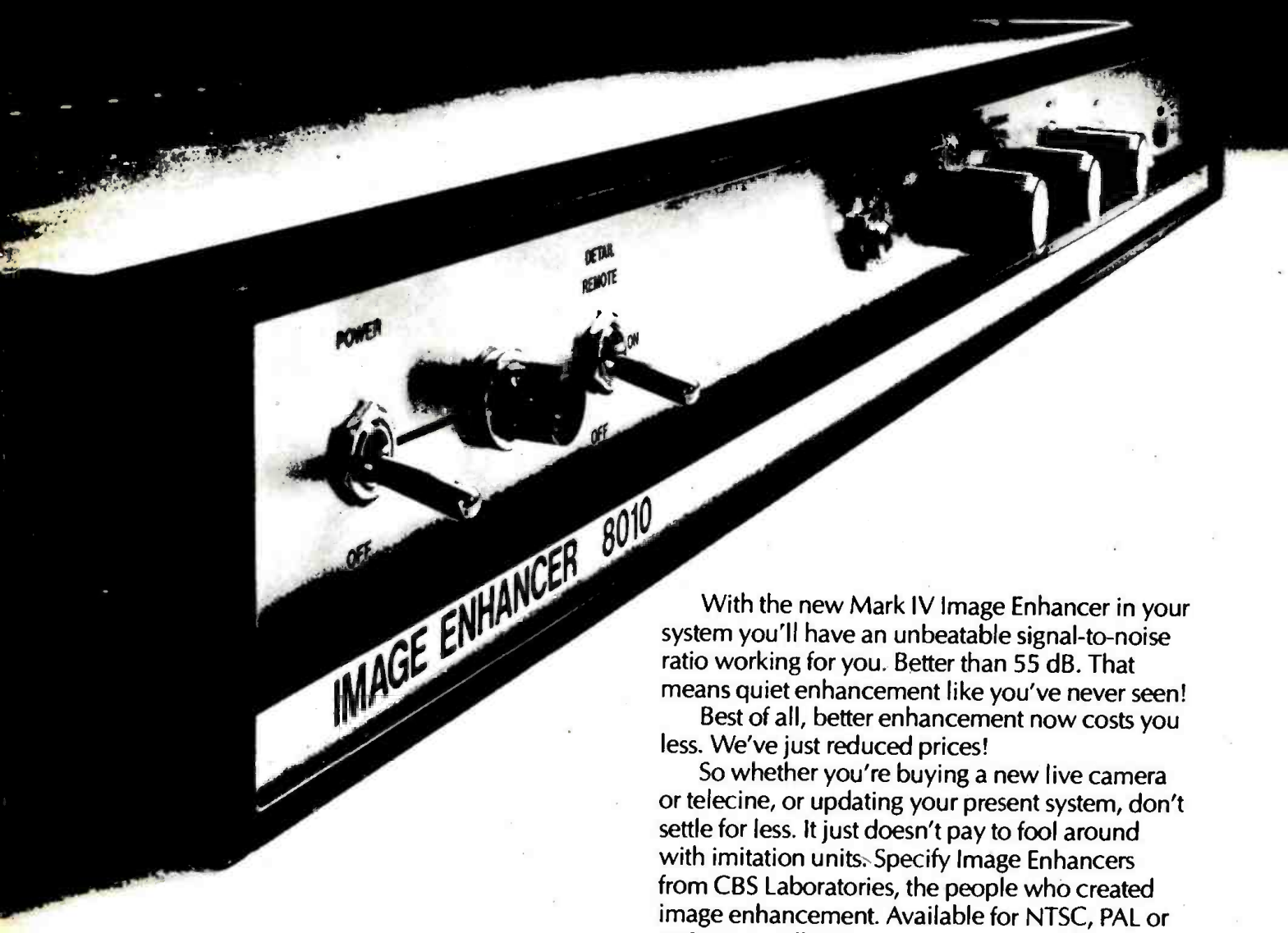
Conclusion

The mandatory local origination rule for cable systems with 3,500 or more subscribers is no longer applicable. However, such systems must provide public access to equipment for production and presentation of cablecast programs. The "natural break" advertising rule is repealed. Cable operators are subject to restrictions on (and in some cases, prohibition of) access equipment and access channel time charges. Operators must adopt operating rules and file same with the Commission 90 days after access equipment is made available.

The new late night programming rule may permit an expansion of program offerings for many cable systems. Late-night audiences, now small but growing in size, merit increasing attention by cable systems operators. Many CATV's are investigating the economic feasibility of importing stations with attractive programming, as permitted by this new rule. **BM/E**

[8] But special note should be made by a cable system that imports a station after midnight. If a program will be broadcast during the same day by a Mountain Time Zone station that is entitled to same-day exclusivity protection, that program cannot be carried.

Here's the real lowdown.
Low noise at a new low price.



With the new Mark IV Image Enhancer in your system you'll have an unbeatable signal-to-noise ratio working for you. Better than 55 dB. That means quiet enhancement like you've never seen!

Best of all, better enhancement now costs you less. We've just reduced prices!

So whether you're buying a new live camera or telecine, or updating your present system, don't settle for less. It just doesn't pay to fool around with imitation units. Specify Image Enhancers from CBS Laboratories, the people who created image enhancement. Available for NTSC, PAL or SECAM installations.

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9TH International Television Symposium And Exhibition

Montreux, May 23–29, 1975

SWISSAIR

Dear Broadcaster:

You are cordially invited to join BM/E in a special trip designed to take you to Montreux to attend the Ninth International Television Symposium and Exhibition. This biennial Symposium has become the industry's most preeminent convention drawing leading authorities from every part of the world. Over 60 renowned International companies will be exhibiting the state of the art in equipment.

BM/E's International TV Tour has been prepared to offer the least expensive air and land rates available to encourage American broadcasters to attend this important event.

Two programs are available. The prices differ according to the quality of hotel chosen in Montreux. A post-symposium offer is included in order to qualify the use of a 14 day GIT air fare.

Itinerary

May 22	Depart New York (JFK) for Geneva via Swissair Flight No. 111.
May 23	Arrive Geneva and transfer by Motorcoach to Montreux hotels. Attend TV Symposium—Welcome cocktail party and International Review.
May 24 through May 29	Hotel accommodations with breakfast daily and attendance of TV Symposium and Exhibition.
May 30	Depart Montreux after breakfast for Geneva where you will start your second week of personal business or leisure.
May 30 through June 5	One week including car (Volkswagon 1200 or Fiat 127) (Two per car) unlimited mileage. 7 nights in a typical Swiss guesthouse (location of guest-house will be assigned before departure).
June 5	Return to Geneva airport by noon to relinquish your car and check in for return to New York on Swissair Flight No. 110.

Tour Prices

Package A	Deluxe Hotel	$885.
Package B	First Class Hotel	$785.

Single Supplement Surcharge on request

The above Tour Price Includes:

- Economy-class air ticket New York/Geneva/New York based on 14/21 day GIT fare.
- Transfers by private motorcoach from Geneva to Montreux upon arrival and Montreux to Geneva on May 30.
- Registration Fee for International Symposium and Exhibition.
- 7 nights hotel accommodations in Montreux double-occupancy in Deluxe or First Class hotel according to choice.
- 7 Continental breakfasts in your hotel in Montreux.
- 7 days car rental with unlimited mileage. (Volkswagon 1200 or Fiat 127) (Two per car).
- 7 nights in a typical Swiss guesthouse (location of guesthouse will be assigned before departure).

Optional Accommodations to Above Offer

Second Week

1) Hotel accommodations at *Ambassador Hotels* throughout Switzerland.* The hotel will be allocated in the city of your choice or nearby, subject to availability—Cost $15 per person per night including breakfast, taxes. (i.e. 6 nights $90.)

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* List of hotels available upon request.

For both options payment is requested in advance and vouchers are issued accordingly.

Please fill in the attached coupon and return as soon as possible. A deposit of $100 per person made payable to BM/E must accompany your reservation request. In case of cancellation the deposit is refundable in full up to 30 days prior to departure.

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Please enter_____reservations for the trip. I have enclosed a $100 deposit for each reservation requested.

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Name (print)_____

Company or Station_____

Street Address_____

City_____ State_____ Zip_____

Phone No._____

Wife's first name if she is traveling with you_____

The "Greatest Show" Set To Open In Las Vegas

NAB will do it again in April: put on an Annual Convention that outdoes all previous NAB Conventions. Early demand for exhibit space was running ahead of last year. The technical program, the special speakers, will all have genuine value and interest for broadcasters.

With the storied pleasures of Las Vegas within easy striking distance of the Convention setting, the National Association of Broadcasters will open its 53rd Annual Convention on Sunday, April 6th, in the Las Vegas Convention Center, with early indicators pointing to the largest product show in NAB history.

The Convention will offer those who come a familiar mix of technical papers and panels, distinguished luncheon and dinner speakers, and a whole-industry product exhibit.

Attendance may be down, but . . .

Las Vegas may not be the lure that the NAB hoped for. Preliminary figures from our annual "Panel of 100" survey shows that only 57% of those responding to BM/E's poll will be going. This is exactly the same number that said they would attend Houston, but less than the Chicago and Washington shows.

The "mix" of those attending is somewhat different than last year. TV managers will show up in greater numbers; 82% compared to 69% last year. But TV engineers will decline—61% in 1975 compared to 70% last year. Radio managers may be there in fewer numbers than ever before—only 42% said they would be going. On the other hand, more radio engineers will be going—up 14%.

Those that will be attending have a keen product interest. Every TV manager, TV engineer, and radio engineer, planning to attend Las Vegas, has a specific product in mind to investigate. The only people without a specific product interest are radio managers.

In the TV area, the equipment of most interest will be time base correctors and hand-held cameras, i.e., gear for electronic news gathering. But switchers are still high on the list. There appears to be more interest in character generators than in previous years. Although the overall interest in TV transmitters has declined, those that intend to evaluate transmitters put them high on their priority list. This same group is interested in remote control.

Interest in studio cameras appears to be way off. There seems to be some stepped-up interest in film chains both in general and for those who put a priority on this product.

In the radio area, tape recorders have bumped consoles as the product of keenest interest. BM/E's article on tape recorders this issue is most timely. And automation is a priority item with many radio managers.

While Las Vegas attendees don't intend to commit themselves at the show, our Panel of 100 respondents reveal higher budgets for equipment than in 1974. We have always been reluctant to report budget figures since only a third indicate their plans. We can say, however, that there are a number of TV stations planning to spend over $500,000 next year, and an impressive number of radio stations with budgets over $30,000.

BM/E's March issue will have a complete rundown on products to be exhibited, based on advance reports from the companies that will be on the floor.

A few companies have made partial announcements about their exhibit plans. CBS Laboratories will emphasize their new automatic color corrector, and will show in addition their line of signal processing equipment. International Video Corporation will add to the equipment available for electronic news gathering with a portable, hand-held video camera that they say produces pic-

Overall Interest in TV Equipment

	Percent Interested 1975	Percent Interested 1974
Time Base Correctors	64%	N.A.
Production Switchers, large 30)	52	47
Production Switchers, small 22)	—	—
Character Generators	46	40
VTRs quad	44	47
TV Cameras, Portable	44	N.A.
Test Equipment	44	45
Audio Consoles	42	38
Video Cartridges/Cassettes	40	47
Picture Monitors	40	43
Film Chains	34	30
Video Tape Editors	32	41
VTRs Portable	32	N.A.
Routing Switchers	32	N.A.
Master Control Switchers	32	N.A.
Remote Control Equipment	28	24
Transmitters	24	34
TV Cameras top-of-line	22	36
TV Cameras med. price	16	40

Overall Interest in Radio Equipment

	Percent Interested 1975	Percent Interested 1974
Tape Recorders/Players	78	57
Consoles Mixers	53	65
Cartridge Players	49	62
Automation Equipment	46	42
Audio Processing Equipment	43	38
Test Equipment	39	N.A.
Remote Pickup & STL	32	32
Noise Reduction Systems	32	N.A.
AM Monitoring Equipment	28	38
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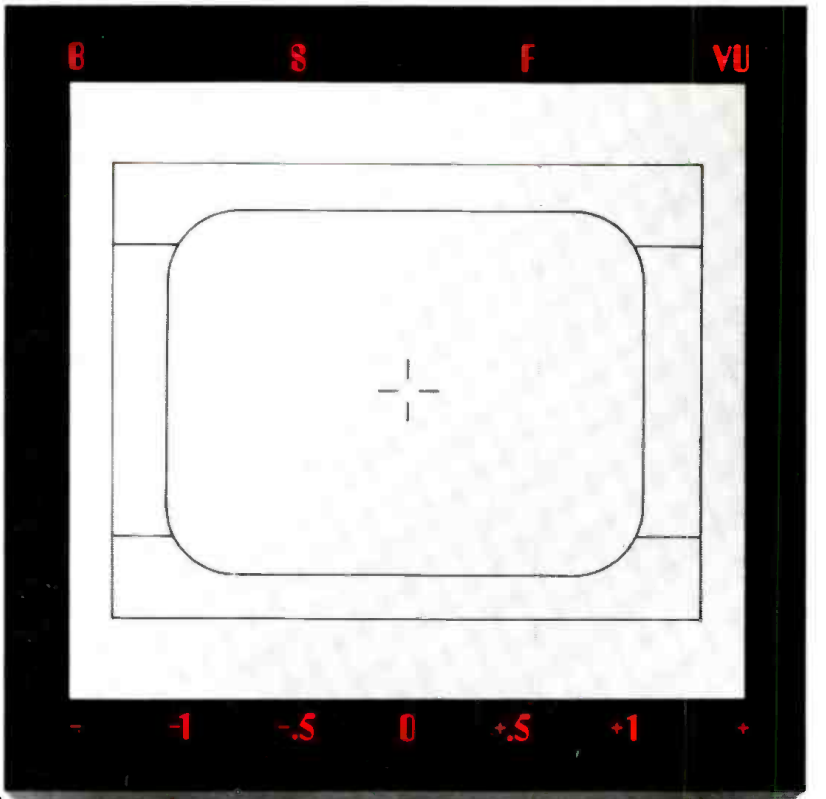
INTRODUCING THE ...ATION



...*play* system
...cameras keeps
... times about critical
...ating conditions. It is
...rganized, easy to interpret,
...e and dependable in performance.

This is how it works.

Advanced solid state circuitry permits the use of dependable light emitting diodes (LEDs) as monitoring devices, rather than the usual delicate metering needles which are so susceptible to damage.

Above and below our unique CP-16R fiber optics viewing screen, various LEDs light up or change in intensity as they monitor vital camera functions. You get all the information you need, *only* when you need it. Most of the time, no more than two LEDs will be on at any given moment. So you can concentrate on your prime objective: filming the scene!

The following indicators are standard equipment on all 1975 CP-16R reflex camera models:

B — for "Battery." It lights up *only* when your battery is low.

S — for "Sync." It lights up *only* when your camera is running out-of-sync.

F — for "Footage." It lights up *only* when you're about to run out of film (whether you're shooting with 200 ft. or 400 ft. film loads).

VU — for "VU Meter," of course. Here, the varying intensity of illumination indicates modulation levels in the CP-16R/A camera with built-in Crystasound amplifier.

The exposure information (at the bottom of the display) is featured only in CP-16R reflex cameras equipped with our *optional* semi-automatic or fully automatic exposure control system. In which case, the illuminated **0** represents "Correct Exposure." And the symbols to the right and to the left, progressing in ASA half-stop increments, light up to indicate over- or underexposure.

Our CP-16R *information display* truly informs, without distracting. Without cluttering up the viewfinder. Sure, 1975 CP-16R camera models cost more. But the *information display* alone is well worth the increase. And it is but one of the many new innovative design features that make the CP-16R reflex the most outstanding 16mm camera system ever!

CP-16R/A reflex camera shown with *optional* fully automatic exposure control system.

For further information, please write to:

cinema products CORPORATION
technology in the service of creativity
2037 Granville Avenue Los Angeles, California 90025
Telephone (213) 478-0711 ■ Telex 69-1339 ■ Cable Cinedevco

Circle 124 on Reader Service Card

ture quality equal to that of the company's studio camera, Model 7000. Video Memory Corporation will introduce a nonsegmented helical VTR for 1″ tape, the VR-1, which claims performance at a very high level, and sells for about $9400.

RCA will push their new smaller quadruplex VTR, the Model 600, which was shown in prototype last year and will be ready for delivery at just about show time this year. However, there is no sign yet of an unexpected major entry in the top-quality race that would match last year's last-minute unveiling by Ampex of the AVR-2. Ampex, RCA, and IVC will all have the machines that entered the great VTR race last year, the IVC's helical challenge to the reign of the quadruplex still in being.

Among the many technical sessions will be a series of papers on the all-solid-state AM transmitter, and another series on circular polarization of TV transmissions, both currently "hot" topics for broadcasters. And among the numerous distinguished
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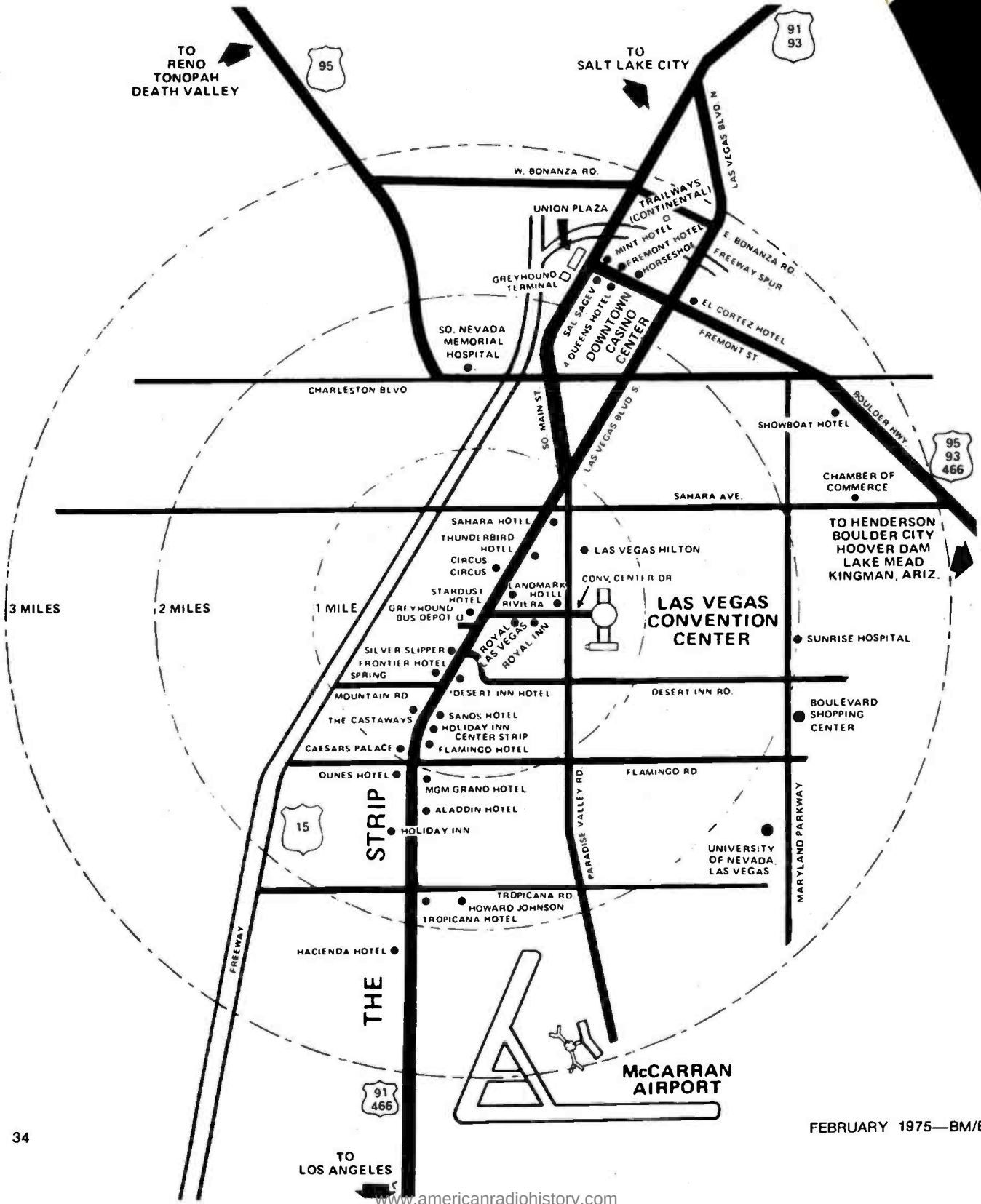

Getting Acquainted With The Las Vegas Terrain

The toughest thing to lose in Las Vegas is your *way*. There are only two areas of major importance: The Strip or the downtown Casino Center. There's more action than you can handle at either one.

The Strip is in fact a roughly three-mile stretch of the Las Vegas Boulevard, bursting with hotels, casinos and other awesome attractions, bounded at one end by Tropicana Avenue and at the other by Sahara Avenue. (The Convention Center is just a little off the Strip near the Sahara end—next to the Las Vegas Hilton.)

The Casino Center is a more compact area located on East Fremont Avenue at the northern end of Las Vegas Boulevard. Compressed into a three-square block area is more casino space than you can explore in a week, all wrapped up in a 43-mile long neon light network that boasts a $65,000 a month electric bill.

Here's a list of the main hotels in both areas, including addresses and telephone numbers, and an accompanying map to help you get your bearings in advance. In making your preliminary plans, be forwarned that, contrary to some prevailing myths, Las Vegas is not any less expensive than other comparable convention sites in terms of hotel accommodations, meals and nightlife. Those lengendary complimentary suites and lavish meals are pretty much restricted to the regular "high rollers" who descend upon the town with considerably more frequency than does *our* less free-wheeling assemblage.

Single and double room rates range from $22 to $48 per person, with one and two-bedroom suites starting at around $50 and soaring . . . . . up, of course.

Lunch and dinner prices at the better hotels and restaurants are comparably scaled to the surroundings, with show-dinners hovering in the $25 per person area, but normally well worth the investment, particularly to the Las Vegas first-timer.

And when you arrive, the first thing you'll need will be the soon-to-be-published, handy BM/E Las Vegas Survival Guide, a useful booklet chock full of useful information and tips on everything from restaurant ratings to advice for the novice gambler. If you're looking for an early start, a complete catalog of some 475 books on every conceivable aspect of gambling can be obtained free of charge by writing: Gambler's Book Club (GBC), Box 4115, Las Vegas, Nevada 98016. Their "How To/How Not To" booklets on the six principal games of chance (Baccarat, Blackjack, Craps, Keno, Slots and Roulette) could save you a lot of confusion (and grief) especially if your background is friendly penny-poker.

The Vegas Credit Credo:

If you are not an established casino regular, your credit rating is non-existent. More explicitly, don't bother to bring your personal checkbook to Las Vegas without an official Bank Letter of Credit, a document which at least affords you the privilege of having your credit line painstakingly checked. This rule of thumb applies not only in the casinos but in hotels, restaurants and shops as well. Major credit cards will get lodging and meals, but if it's chips you desire, be sure you can back every purchase with legal tender!

Ground Transportation in Las Vegas

1. NAB Shuttle Buses: There will be free shuttle buses running from all hotels to the Convention Center and back frequently during each day.
2. Rates from airport: coaches depart hourly for all hotels from McCarran Airport. Fare is 50¢. Taxi rates average $2.50 to hotels on the Strip, up to $3.50 for hotels in the Downtown Casino Center. Major hotels provide regular service to and from airport by private coach or limousine (standard phone call upon arrival procedure). Fourteen car rental agencies are located at McCarran Airport, including all the majors. Prevailing rates are low.
3. Taxi Service: taxis are as reasonably-priced as they are numerous. Meters start at 65¢/$1.15 1st mile/60¢ each additional mile. In Strip area, and from Strip hotels to the Convention Center, fares will average $1.00–1.50, and a bit more from the Casino Center.
4. Public transit buses are available up and down the Strip at 50¢ for adults, 15¢ for children.

Resort Hotels Along "The Strip"

Hotel	Address	Tel. No. (Area 702)
(Reservations thru NAB only)		
Caesars Palace	3570 Las Vegas Blvd. So.	734-7110
Castaways	3320 Las Vegas Blvd. So.	735-5252
Circus Circus	2880 Las Vegas Blvd. So.	734-0410
Desert Inn and Country Club	3145 Las Vegas Blvd. So.	735-1122
Dunes Hotel and Country Club	3650 Las Vegas Blvd. So.	734-4110
Flamingo	3555 Las Vegas Blvd. So.	735-8111
Frontier	3120 Las Vegas Blvd. So.	734-0110
Holiday Inn	3475 Las Vegas Blvd. So.	732-2333
Landmark	364 Convention Center Dr.	734-9110
Las Vegas Hilton	3000 Paradise Road	732-5111
MGM Grand	Flamingo Rd. at The Strip	739-4111
Riviera	2901 Las Vegas Blvd. So.	734-5110
Royal Inn	305 Convention Center Dr.	734-0711
Sahara	2535 Las Vegas Blvd. So.	735-2111
Sands	3355 Las Vegas Blvd. So.	735-9111
Stardust	3000 Las Vegas Blvd. So.	732-7111
Thunderbird	2755 Las Vegas Blvd. So.	735-4111
Tropicana	3801 Las Vegas Blvd. So.	736-4949
(Reservations directly with hotel)		
Aladdin	3667 Las Vegas Blvd. So.	736-0111
*El Cortez	600 E. Fremont	382-1500
*Four Queens	201 E. Fremont	385-4011
*Fremont	200 E. Fremont	385-4011
Hacienda	3950 Las Vegas Blvd. So.	736-2933
*Horseshoe	128 E. Fremont	382-1600
*The Mint	100 E. Fremont	385-7440
Showboat	2800 E. Fremont	385-9123
*Union Plaza	1 Main St.	386-2110

*Located off the North end of the Strip in the Downtown Casino Center

Fewer parts... fewer problems with audiopak® A-2 broadcast cartridge

Ribs are molded into the flange — no pencil leads to break and jam.

No top wire. Reloading's easier.

Tape guide is an integral part of the cartridge base — not glued in — to insure accurate azimuth control.

Try one free

In the broadcast cartridge world, the simpler the better. That's why the design of the audiopak A-2 eliminates parts that can give you trouble.

The lessons learned from our years of experience developing the world's leading 8-track cartridge have been applied to our audiopak A-2. The result is a more durable, more reliable broadcast cartridge. And because we manufacture the entire product – from tape to packaging – we can assure you of the highest possible quality control.

We're so sure we have the best product on the market, we want to prove it... at no cost to you. For your free sample and more information on the audiopak A-2 broadcast cartridge, write on your company letterhead to: Capitol Magnetic Products, Division of Capitol Records, Inc., 1750 North Vine St., Los Angeles, Calif. 90028. Attention: Marketing Manager, Professional Products.

Capitol®
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CAPITOL MAGNETIC PRODUCTS
A DIVISION OF CAPITOL RECORDS, INC.
LOS ANGELES, CALIFORNIA 90028

EMI
TM OF EMI LIMITED

Circle 126 on Reader Service Card

We've all heard about "the problems with tape."

"The problem with tape is... chroma noise... head wear... breakage... print-through... S/N... consistency... sensitivity... slitting... spooling... packaging..." It's been said so many times, it's easy to forget that the problem might not be "tape" ... just the tape that's been available.

After considerable research, development and testing, we've produced something we believe puts an end to many of "the problems with tape." A tape improved in everything from particle formulation to packaging (and just about everything in between). A tape that saves time and money from preproduction through syndication. In testing. Recording. Playback. Editing. Duplication. And re-use. Not to mention the initial cost of the tape itself.

We call the tape H701 High-Band Videotape, and full technical data is available for the asking.

Ask for it, and we'll show our appreciation by making it even easier to change your tape performance standards. With a special offer that will save you considerable money, while our tape saves you grief.

Fuji Videotape
350 Fifth Avenue, New York 10001 (212) 736-3335

( ) I'm interested. Tell me more about H701 High Band Videotape and your special offer.

( ) How can I lose? Call me about an order.

NAME _____ TITLE _____

COMPANY _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

TELEPHONE (AREA) _____ _____ EXTENSION

YOU'RE ABOUT TO CHANGE YOUR TAPE PERFORMANCE STANDARDS.

FUJI
VIDEOTAPE

Circle 125 on Reader Service Card

Your budget problem tonight is the best reason to order ACR-25 tomorrow.

Late at night, these are some of the questions the dollar-conscious station manager asks himself.

Do I need a cassette VTR now? Why not wait until times are better?
If you want to save money now you need it now. The higher your spot volume, the faster a cassette VTR will pay for itself.

By adding automation capabilities you cut hours of man-effort and free your VTR staff for other assignments. And by adding production capabilities you bring in a new source of station revenue.

What are the choices?
There are two. One is only a spot player. The other is an automatic cassette VTR: our ACR-25.

How do they differ?
Basically, in terms of flexibility, speed, and overall capability.

For example, the ACR-25's exclusive choice of sequential or random access allows your operators to load and reload cassettes faster, program routinely or make last-minute changes without panic.

Will my spot programming needs change?
Count on it. It is a fact of life that the number of impressions an advertiser can deliver on TV for his brand is dramatically declining, and his budget can't keep up. An independent study estimated that a $5 million nighttime TV budget in 1965 bought him 38 impressions on all women, 18 years and over. In 1975: 22. In 1985: only 13.

Which means commercials will become shorter. Watch for twenties, fifteens, and soon the basic commercial length: 10 seconds.

Only ACR-25 can play 10 second spots back-to-back.

Is automation really necessary? Now?
Make no mistake; one day, very soon, you must automate your station to streamline the operation and cut costs. Tight money, today, is **accelerating** automation. Station managers in markets of all sizes are looking to automation today, not in the future, in order to save overhead dollars right now.

What is full automation like?
Your operator merely loads all your short segments—taped commercials, promos, off-the-air clips, news inserts, editorials, everything—at random into your computer-controlled, automated ACR-25 system.

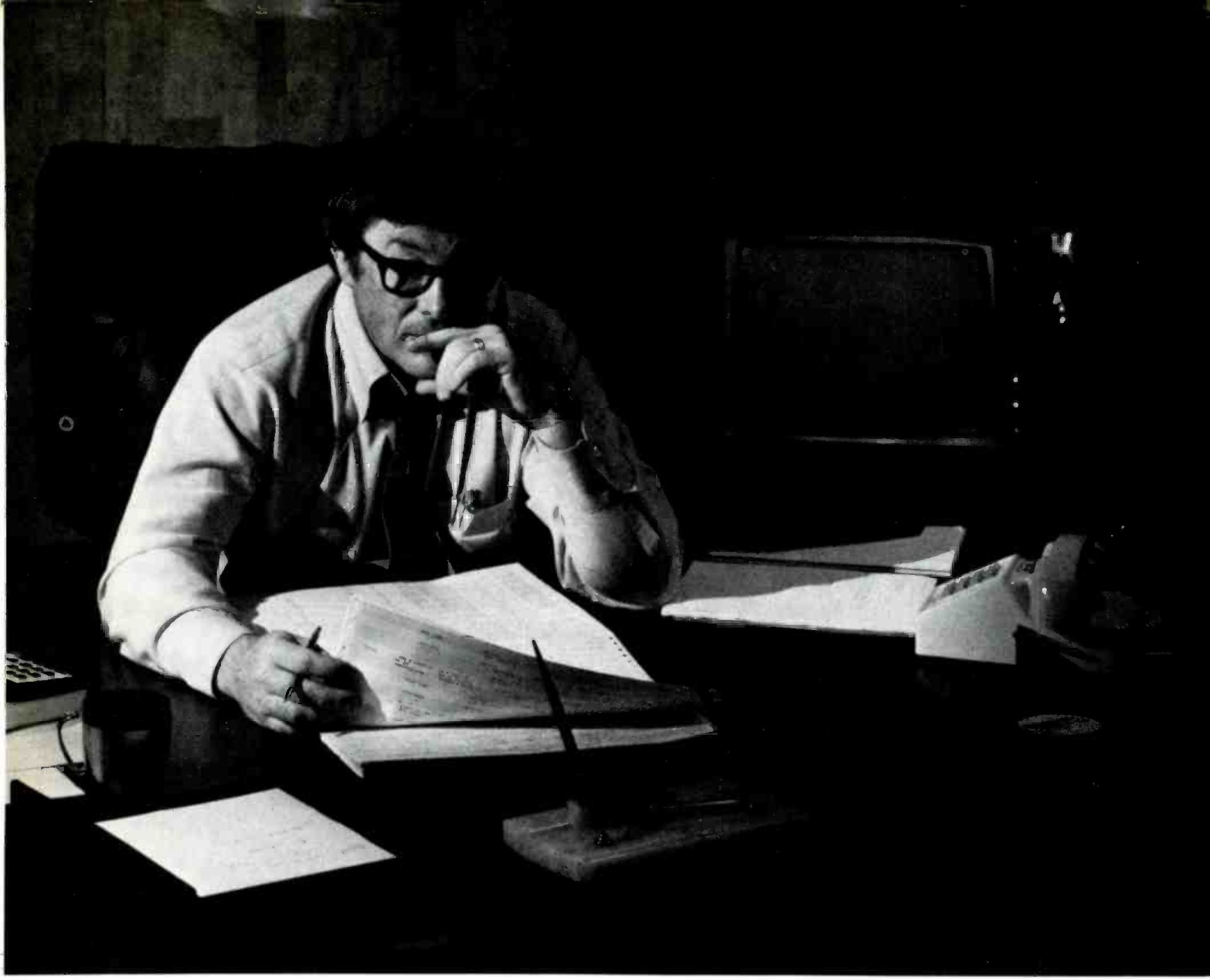
The system writes its own Table of Contents, memorizes each segment, makes up a Playlist, programs it in the order you command, then executes with split-second, error-free timing.

All your operator does is replace cassettes with new ones (reloading, again, at random), and he is free for other duties for up to a half day or more.

How can ACR-25 help me make money on production?
Whether you seek outside production volume or not, ACR-25 will free up reel-to-reel recorders and give you creative options you've never known before.

Use ACR-25 as the master when you make cassettes or reel-to-reel dubs. Record slides with audio. Promos. ID breaks. Dealer tags. Hitchhikers. Open and close billboards for live, on-camera shows. You can even produce prerecorded, pushbutton shows that mix live shots, film, and tape footage.

You'll find ACR-25 particularly useful for recording and editing news or sports segments off a network feed. It's a fact: in minutes you can edit what took you hours before.



What's my return on investment?
Money saved today and tomorrow. Plus a great deal more capability.

When the time comes for you to fully automate your station, you would have to get rid of anyone else's expensive equipment and buy the ACR-25 anyway, because it is the only cassette VTR with full computer control capability.

Until then, it will act as a time-saving, superior spot player, and a money-making, sophisticated production machine.

I'd rather save dollars than hours.
During tight budget days, it is understandably tempting to think this way. A station manager may think that because a spot player makes life easier for his tape room people he can do without it. **Wrong!** The ACR-25 makes their lives more **efficient.** And so the station becomes more efficient.

Wise station managers know that hours are dollars. They carefully add up the ACR-25's time-saving, cost-cutting benefits in terms of their own operation.

It is the most complete broadcast/production unit ever conceived. No matter how you use it, it saves money, manpower, and mistakes, making it the only logical choice for every short-range budget problem.

But we just don't have the dollars right now.
You may surprise yourself. Many stations have discovered we can tailor financing to their needs, long term or short.

Whatever is to your advantage—a lease, tax consideration, low monthly payment, low interest rate—chances are our finance program can help. Also, our trade-in values have never been higher.

So call us in. You might even be able to fund ACR-25 out of your operating budget.

Today's economy is not your enemy if it helps you discover ACR-25. It can help you open the door **today** to a future of increased efficiency and profit. For more details, contact your local Ampex Broadcast Video Sales Engineer, or write for full information.

AMPEX

Ampex Corporation
Audio-Video Systems Division
401 Broadway
Redwood City, California 94063

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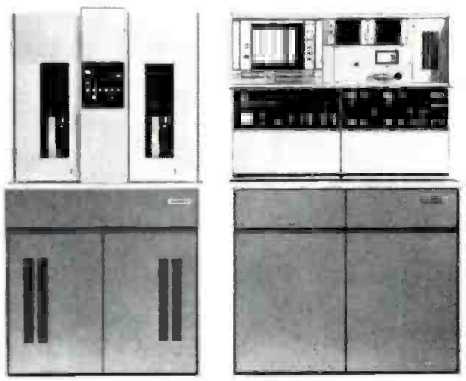


ACR-25

Reel To Reel Audio Machines:
High Performance, The Easiest Operation In History

And that saves money. There are excellent specs not only at the top prices, but also in "semi-pro" machines that cost a half or a third as much. But your chances for day-in, day-out reliability under the heaviest use are still better in the top-price bracket.

We have a new crop of top-bracket audio tape machines, and they have gone a long way toward untieing the operator from the machine: new semi-automatic operation modes have brought the most efficient operation in history. They have also brought us great precision in speed control, and the concomitant feature, i.e., easy sync between audio machines and with video and film machines. And they carry forward the long-term trend to easy maintenance. Most are extremely easy to get into, and plug-in electronics is nearly universal.

We will describe how these advances and others are accomplished in more detail in the following. First here is a quick summary of the new units by brands.

One of the latest models to reach the market, the Ampex 440C, introduced in early 1974, has already established itself strongly: Ampex announced as this was written (late December) that one thousand of the new machines had been delivered. And as the description later along shows, it embodies a number of the important advances we are highlighting in this story.

But Ampex is obviously not alone in the top slot. Each of the following machines was recently preferred by several broadcasters in the survey BM/E made for this article: Scully 280B, MCI JH-110 (a fast rising star), Electrosound 505, ITC 850, Studer A80, 3M 79 Series.

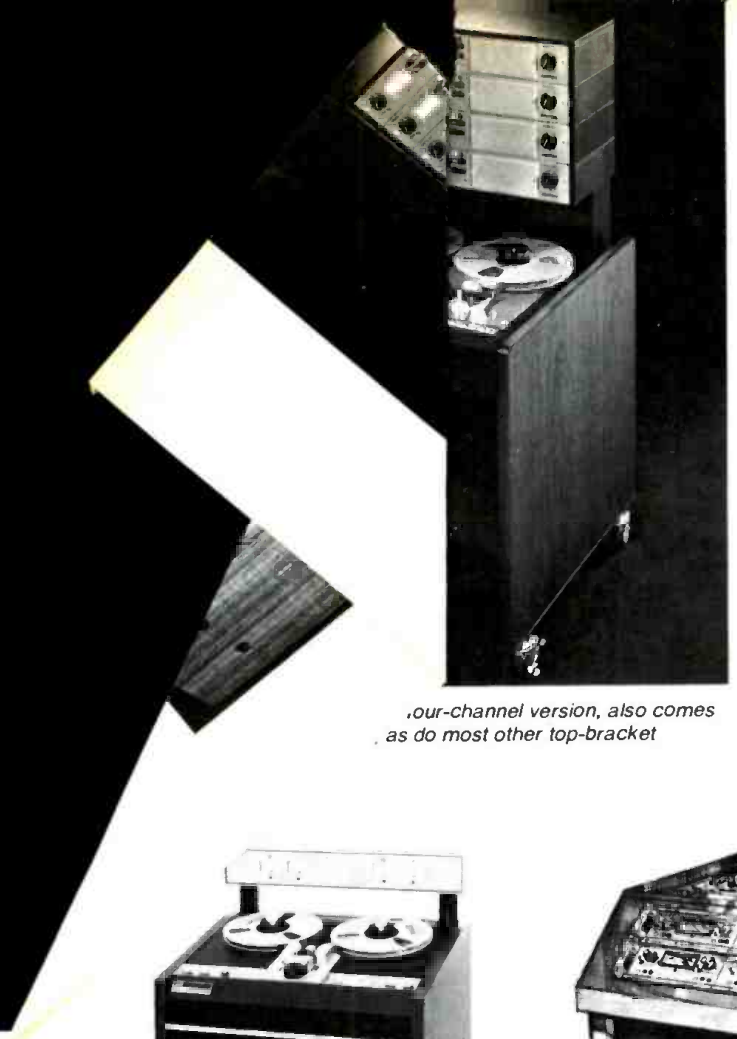
Ready in the wings is another import (by Gotham Audio of New York), the Telefunken M15, which has won rave reviews from recording studio engineers who have tried it. Some other machines in this bracket that put forward state-of-the-art claims are models of Xedit, Tape-Athon, Autotec, L. J. Scully and Telex.

The survey gave BM/E a revealing glimpse of the machines that are still out there carrying a full load in broadcast stations after three, five, even ten years on the job. As most engineers will anticipate, the Ampex 300 series were high on the list. Also prominent were the Scully 280's—the last of the "Bridgeport Scully's" marketed before this brand went West to Metrotech. The current Scully 280B has, of course, inherited some admired qualities from its predecessor—and added some of its own.

A sizeable number of broadcasters have bought what are sometimes called (or miscalled) "semi-pro" models, really meaning that they cost a lot less than the top-bracket machines. In this class are certain models of Revox, Teac, Otari, Crown, with Pioneer beginning to break into this market.

That is *competition,* and the broadcaster can gath-

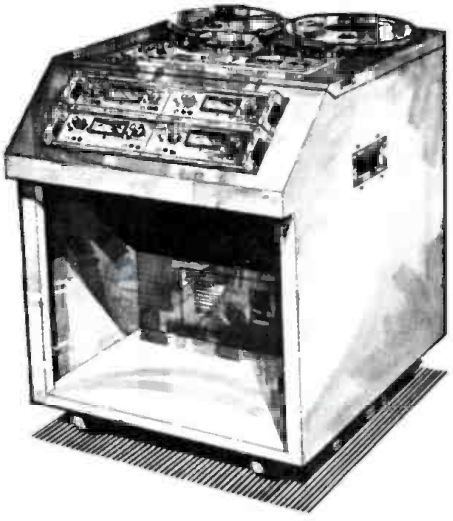
Reel-to-reel audio machines have been a prominent feature at recent NAB exhibits, like this International Tapetronis machine introduced at the '74 show in Houston. BM/E's "Panel of 100" survey, reported in this issue, shows interest in audio machines will be higher than ever this year.



,our-channel version, also comes as do most other top-bracket

Scully/Metrotech 280B is particularly compact, has top plate that lifts for instant access to drive system.

3M Model M79 has "Isoloop" capstan drive, continuous speed control of DC servo motor.



MCI Model JH-110 has "joystick" for moving tape, down to fractions of an inch as wanted.

New import (by Gotham Audio) is Telefunken M15, usable on table or in console or rack.

er in the classic benefits: he is getting considerably more than he ever did before in a tape machine, at all price levels. Here are the principal technical advances that make a number of the new machines look good.

Recent technical advances

The dc capstan motor with servo control allows for very precise and flexible speed control, for example allowing for continuous speed shift over a wide range, or for very simple switching to the various standard speeds; it also makes sync with video machines, film cameras and projectors, and between audio machines, easy and precise. It helps in getting the flutter figures to new low levels (see the discussion on specs in the following).

Motion sensing, plus control logic, allows instant shift from any operation mode to any other, without going through "stop", and with no danger of tape spills or breaks. This has been coming in for some time, is now very general.

Another refinement available here and there for a long while but now quite general on top-of-the-line machines is servo control of the tape tension, which increases precision by minimizing flutter, speed instability, and further reduces the chances of tape breakage.

Real-time tape position indication now often uses "counters" calibrated in minutes and seconds, electronically resettable to zero.

Automatic "return to zero" on rewind takes the tape back fast to zero on the time indicator without any attention from the operator, an important time saver in production work.

An extension of the last is the auto locater which takes the tape automatically in rewind or fast forward to *any* spot on the tape, using an address code for all

Teac Model A-7300 has DC-servo capstan motor, three-position switches for bias and equalization.

Otari has built-in test oscillator, calibrate settings on controls (as have a number of others), comes in two and four channels.

the editing points (this is an optional accessory for a number of machines).

Substantially improved editing provisions (in addition to fast location) also help to lighten the operation load and make results more precise. Among the outstanding devices of this kind is MCI's "Joystick"; it moves the tape in large or tiny steps as wanted (see below).

Generally supplied now is solid-state switching, which is smaller, more reliable, quieter, than relay systems (which are definitely obsolete at the top prices).

Also quite universal is low overall mechanical noise, making a number of the new machines excellent for work in the same room with the on-mike disc jockey or newsman.

These more efficient operating modes are most helpful for production work, when program material is being mixed down or edited. A machine that will be used only for playback of already-edited material needs automation less, in the sense that there is less time-saving available; but the easier operation naturally adds to efficiency in any case.

It is worth noting here that production work is being done more and more on *multi-track machines*, from four-track up to 16, in broadcast stations. The flexibility, ease of changing parts of a program, that are inherent in multi-track recording, with subsequent mixdown, are saving money for many stations, especially those that produce commercials for outside clients. But the benefits apply to the station's programming too, even when it is all mixed down to mono.

New recorders are more accessible

On the easy maintenance score, high accessibility is now the rule: any machine that doesn't allow you to reach the whole electronic section by opening a single door, or by lifting the top plate like a lid, or by some other 10-second operation, is behind the times. Test points are often right on top; built-in calibration helps reduce maintenance time.

Plug-in electronics not only provides for instant "repair", but may also allow for quick changes in the system, as for example a change from NAB to CCIR equalization. Generally speaking, changes in equalization to match changes in speed are automatic when the speed is switched.

Lest we be accused of losing our heads over the new accessibility, we must point out that perfection on this score has not arrived in every machine. There is still poor design here and there. One engineer interviewed by BM/E swore that it took him three hours to replace the indicator lights on his new machine. Another pointed out that a popular model came out originally with no labelling, or poor labelling, on a number of the crucial operating controls, throwing an unacceptable weight on the operator's memory.

The lesson of all this is that the broadcaster can demand easy operation and excellent accessibility. Keeping an audio tape machine in top shape ought to take today a small fraction of the time required as little as five to seven years ago.

Specifications are outstanding

This improved maintainability is all the more important, even necessary, since "top shape" is considerably higher than it used to be. We have had excellent specs on a few machines for a long time. What are the numbers to look for in the specs today? At 15 psi, we should expect real flat response (not just claims) to at least 16 kHz. On noise, the measurement standard has to be noted carefully. (See discussion on this in box). *Weighted* flutter ought to be below about 0.08%—figures from 0.04% to 0.06% are becoming fairly common setting a new, lower floor for flutter specs.

On distortion, we are usually measuring the *tape* and the *recording level:* all the machines in the high brackets add extremely little distortion on their own.

Specific specs, top bracket machines

Enough of generalizations; here is a model by

Electrosound 505, seen here at '74 NAB, has optional third reel to ease editing.

Pioneer RT-1050 has two switchable speeds, plug-in head assemblies for 2-track and 4-track use.

Ferrograph Studio 8 has modular electronics (very general), interchangeable head blocks.

model summary of the top bracket machines—$2800 and up for a two track model—giving in each case just a few facts. Nearly all these machines have, in addition to what is listed here, many or most of the good features we have outlined in the foregoing, and all have excellent specs.

Important note; most of the listed machines are available in versions for ½″, 1″, and in a few cases 2″ tape for four or more tracks, in addition to the standard ¼″; two-track versions. As noted already, the multi-track versions are becoming the norm when heavy production work has to be done. They can be money savers in any busy production shop.

Ampex 440C—DC capstan motor with servo control (or synchronous motor as an option); sapphire tape guides and scrape flutter idler for extremely low scrape flutter; calibrate positions on record and playback controls; tape guides instantly rotatable for ¼″ or ½″ tape; head assembly mounts with a single screw; gold-plated contacts on plug-ins; claims ± 1 dB response to 25 kHz at 15 ips, possibly the highest "high" response of any audio machine.

Electrosound ES-505—Built-in test oscillator; third reel (driven) for taking up take during editing; edit button allows tape to move without going on to takeup reel.

ITC 850—Mechanical design for especially long life; automatic tape marker puts mark at edit points; convenient editing controls; gold-plated plug-in contacts; excellent accessibility.

MCI JH-110 Series—Strong on useful automaticity: "joystick" control for tiny increments of motion in either direction or large steps, at any speed wanted; speed control, using dc servo motor with phase locked control, allowing plus or minus 20% speed referenced against internal crystal oscillator, or 5-volt external signal for sync to audio or video machines; auto locater with address code system optional, providing velocity-proportioned approach to any spot on tape without overshoot; speed continuously variable 5 to 45 ips, or 2.5 to 22 ips.

Understanding S/N Figures: A Note On Reference Standards

The S/N figures given for most professional audio machines today are in an important sense measurements of the *tape* rather than of the *machine*. The "S" in the ratio is the peak signal at some arbitrarily chosen distortion level, traditionally 3%. In general, modern top-bracket machines are responsible for a very small fraction of that distortion: most of it is from the non-linearity of the tape itself. Thus the *tape* primarily establishes the "S" level in noise measurements. The recent "hotter" tapes that can take a bigger signal than older tapes before overloading have allowed tape recorder manufacturers, with total justification, to set their "S" levels higher than ever, which is a big reason for the best noise figures in history.

But there is no general agreement as to just where that level should be. Thus a full description of a noise measurement should include a statement of the peak level used, in nano-Webers per meter of track width (nWb/m), which further entails *specifying the width of the track*. We also need to know whether or not the noise was weighted according to the NAB standard.

An example of a fully-described noise measurement is given in a recent spec sheet for the Scully 280B. The tape used is stated: 3M 206 "or equivalent". The peak signal level is 500 nWb/m, the noise is weighted to the NAB standard. A table gives the results at various track widths, and we naturally get the best figure on a full track (72 dB at 15 ips), with half-track 3 dB lower.

A number of other makers say "3% distortion", according to long-established habit, for the peak level, but this must include a statement of what tape is used. There seems to be some agreement that with 3M 206 and other similar tapes the 3% point *is* in the neighborhood of 500 nW/m (Revox uses 514 nWb/m), so to that extent we are on a common footing.

Scully/Metrotech 280B—Optical motion sensing for instant mode shifts; mother-daughter PC board electronics for simplified maintenance; selective synchronization for alignment of program material on separate tracks; motor board lifts for quick accessibility.

Studer A-80—Tape tension sensors control torque of takeup and supply reels; optical motion sensing for control logic system; electronic speed control of capstan motor, allowing use of either 50 Hz or 60 Hz supply; selective sync provision; minutes/seconds tape location indicator.

Telefunken Magnetphon M15—DC capstan drive, electronic control; tape tension servo control; ruby tape guides, plus idler between play and record heads, for low scrape flutter; swivel-out amplifier section; sophisticated logic, motion sensing; head assemblies replaceable without need for head realignment. In general, head realignment is not necessary—guaranteed permanently accurate.

RCA RT-21—Cue speed control; velocity-sensing brake system; optional fourth head for 4-track playback.

3M Series 79—DC servo-control capstan motor, allowing 7½, 15 and 30 ips speeds, plus continuous variation 5 to 45 ips; NAB and CCIR equalization can be set up for switchable selection; looped capstan drive for tape tension control; separate sync equalizers and amplifiers with same characteristics as main; auto locator using address code available as accessory; also sync unit, SMPTE edit code generator and reader.

Lower cost machines

In the $1800-and-down "semi-pro" bracket we can find excellent specs, but naturally less automation and less refinement of drive and control. And we also have a spottier record on reliability in use. Some machines have done well in one station, very poorly at another. There *are* "scare" stories on top bracket-machines, but there are comparatively more of them about lower-cost machines—which is hardly a surprise.

Machines in this class that are now most widely used by broadcasters include the Revox A77 and some models of Teac. Both brands have supplied excellent technical performance at low cost, in the view of many broadcasters.

Revox's new A700 is clearly intended to supply some of the new operation modes and new "maintainability", at a price—$1800—still significantly lower than that of the top-bracket machines. It has motion sensing, tape tension servo control, dc capstan motor. The good track record of the less expensive A77 will influence broadcasters to consider it's big brother carefully. Similarly some Teac models have done well for a number of broadcasters. For example, at the National Black Network in New York, a Teac 4070 supplies "fill" music on an all-day basis for the subscribing stations.

Other makers with machines roughly of the same class are Otari, Crown, Pioneer. Any broadcaster who wants to keep his tape machine investment lower than $1500–$2000 ought to look the five brands over carefully.

But how does the broadcaster find out what a machine is likely to do when called on for 12 or 18 or 24 hours a day of playing, rewinding, stopping, starting, recording, etc.? The buyer's best recourse is the old standby; talk to as many users as possible. Get a list of users from the salesman, and nose out a few more if you can. You might uncover, as BM/E did, a prestigious machine that in a few early models accidently erased tape when a minor failure occurred in playback mode. That is a really rare one, but a tendency to break down or lose specs in heavy use is fairly common.

Whatever you find out about a machine's durability, a supplier known for quick, effective service, with nearby supplies of spare parts, is worth a good 25% or more on the price. If you need several machines, having them all the same model has the obvious advantages in the spare parts department, and also in your technician's ability to get a quick fix on trouble.

Recent Advances In Videotape Recorders

Since the last NAB Exhibition in Houston, the most notable new VTRs are the Sony 2850 production cassette unit (with the companion battery-operated portable unit the 3800), a 2-in. helical format from Sony and a 1-in. helical unit from a brand new company, Video Memory Corp.

The NAB Convention in Houston last March was a good benchmark for marking progress in videotape recorder advancements. Preconvention publicity centered on the IVC-9000, a two-inch segmented helical format unit designed to outgun the quad format introduced seventeen years earlier. The format used one-half of the tape that quads do at 15 ips and head life was guaranteed for 1500 hrs. The IVC 9000 also offered two audio tracks and furthermore the cost was about 2/3rds that of quad. But Ampex and RCA were not about to let the reign of quads end.

RCA showed a prototype TR-600 unit about half the size of existing quads and priced at $79,500; good performance (with a lot of automatic features) at 7.5 ips was demonstrated. Further, RCA demonstrated that it could get two audio tracks from a TR-70C, for those impressed with that feature. A coup of sorts was pulled by Ampex. That pioneer company in magnetic

recording celebrated its thirtieth year in business by placing on the market what it called, "the world's first modular design studio quadruplex videotape recorder/reproducer." The AVR-2 was designed to operate at 7½ ips or 15 ips and to accommodate two audio tracks. Its price started at $69,000. At the same time, Ampex distributed a white paper discussing the desireability of modifying the existing quadruplex standard to *a*) incorporate two audio channels and *b*) to introduce a pilot in the video to improve time base correction—a point RCA had been making. In one fell swoop Ampex deftly argued against RCA's position for a pilot (too big a change in format hurting compatibility) and against totally new standards (IVC) by saying two audio tracks and slower speed could be had with quad.

Since that time, it would appear that many of those who were saying they wanted the economy that IVC first delivered have decided to stay with quad format by purchasing AVR-2s. Ampex has said it has sold over 100 such units. The IVC 9000 has been shipped to broadcasters and production houses but not in such large numbers. The European market, a prime target for IVC's effort (jointly with Rand and Thompson-CSF), has been moving slower than expected. The Europeans, therefore, have not reshaped the market or the effort of manufacturers to the extent they might have.

RCA is moving ahead with the TR-600 and will begin deliveries to customers the beginning of April. The Canadian Broadcasting Corp. has leased two of these compact units (700 lbs) along with TK-28 film telecines, to aid in the television coverage of the 1976 Montreal summer Olympics. This unit follows the standard quad format.

In the meantime some big advances have been made at the so called low-end of the spectrum in helical VTRs. Most noticeably, the video cassette has moved in the burdgeoning field of electronic news gathering. Sony, with its 3800 battery-operated portable cassette recorder and 2850 Master recorder with editing capacity is now a standard at several stations that have gone the all-electronic route of news gathering (see BM/E, January issue). The capabilities of the 2850 are covered in a separate article in this issue.

Nor has the reel-to-reel sector been quiet. Again Sony has produced a helical unit that has performance rivaling that of the best professional recorders. This unit is not well known in broadcasting circles since Sony feels it can make faster marketing headway in the industrial/educational training sector. A description of this unit follows.

Another quite reliable helical unit is the VR-1 developed by a new company, Video Memory Corp. The company calls the VR-1 "a new generation VTR." That is a bold claim but the VR-1 does offer remarkable features for its low base price of $9400. It offers a single capstan drive with vacuum chambers for precise tension control, omega wrap format interchangeability, and high band color for reduced moire. This piece of equipment became possible as a result of the wide window that today's time base correctors can accept. Some of the features of this machine are described below.

The field of video tape recorders is indeed active and one can expect to see a lot more in the area of

RCA's miniaturized quadruplex video tape recorder, the TPR-10, is shown in an outside broadcast van of Videomobile Systems, a Hollywood teleproduction company.

portable units—either for news gathering or use in small vans. In the latter category falls the TPR-10 quadruplex recorder from RCA. This unit also made its debut at Houston but was somewhat eclipsed by its bigger brothers. It is now in use in a number of locations. Video-mobile Systems, a Hollywood teleproduction company was one of the first customers.

A portable quad saves the trouble of converting from one format to another. It may mean simpler editing if a user is already equipped with a certain editing system. The one-time advantage of sticking with a single format because of a loss in quality resulting from third or fourth generation tapes is less of a concern today. Many machines are so good now that fourth and fifth generation tapes are hardly distinguishable from the master.

The VR-1: A New Generation of A Video Tape REcorder*

One-inch helical-scan video tape recorders were introduced in the early 1960's. Performance of these recorders was marginal due to low signal-to-noise ratio and large time-base error when compared to broadcast standards. However, they were compact and considerably cheaper. In the 1970's significant breakthroughs were made in the development of head transducers and recording tape. High energy tape and hard-pressed ferrite heads, when incorporated on video recorders, increased the signal-to-noise ratio approximately by six dB. Also, the large window of the digital time-base corrector allowed for complete elimination of the large time-base error problems of the helical scan recorders. However, to date, the inroads of one-inch machines into the broadcast market has not been extensive. Apparently limitations of some formats, tape interchange problems, inferior tape handling, or just the general lack of a standard one-inch format impede the progress of one-inch tape re-

* Material on the VR-1 was prepared by J. M. C. Tucker and D. T. L. Chang of Video Memory Corp. Mr. Tucker is an engineer, Mr. Chang, also an engineer, is president of the company.

corders in the professional television marketplace. The VR-1, developed and manufactured by Video Memory Corporation, is a new generation video tape recorder which has been designed to overcome these drawbacks and fill this market need.

Several unusual features

The VR-1 recorder uses a non-segmented, helical "omega" format with 1000 inches per second (ips) writing speed and a 9.6 ips tape speed. The high band color signal system (7–10 MHz carrier) with its reduced moire and high signal-to-noise ratio expands post-production capabilities to more than five generations. The non-segmented format eliminates the possibility of banding or first line error in the playback picture. Recording and playback for two audio tracks and a control track are provided. Each track is independent from the other with no tracks overlapping, thereby providing for a full range of editing. This format allows for interchange of tapes recorded on other "omega" format recorders.

The transport design of the VR-1 recorder eliminates belts, clutches, pinch rollers, mechanical tape counter, mechanical brakes and retrievable guides. It utilizes a single-capstan drive system with vacuum columns to provide gentle tape handling and precise tension control. On helical scan recorders, generally, heretofore available, the friction generated by the tape guides to guide the tape along the helical angle creates a tension problem. This problem is non-existent in the VR-1 recorder. The vacuum column tape tension system used in the VR-1 recorder overcomes the tension problems while providing the user with a number of other advantages not found in other one-inch recorders.

Specifications of the VR-1 recorder include:

Video Bandwidth: ±0.5 dB, 30 to 4.2 MHz; −3dB at 5 MHz

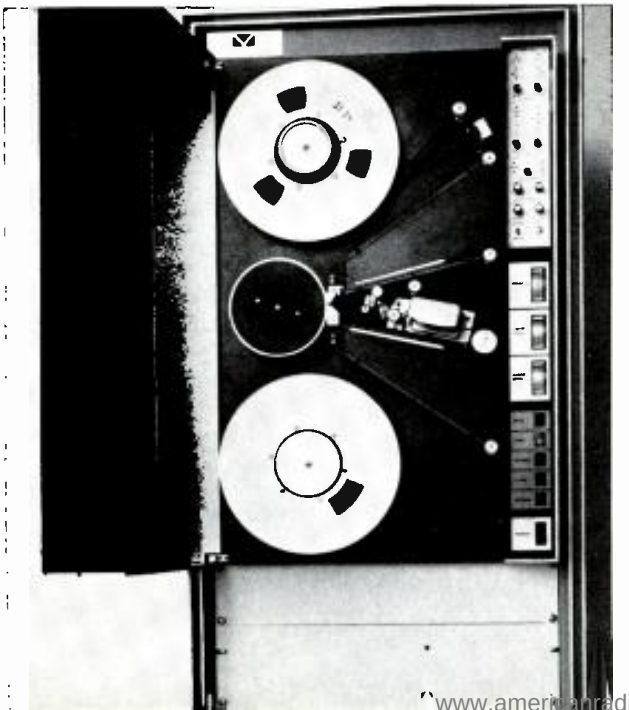
Signal-to-Noise (unweighted): 46 dB p/p Video to RMS Noise

Differential Gain: 4% max blanking to white

Differential phase: 4° max at 3.58 MHz off tape

Chrominance to Luminance Delay: 15 nsec max

Video Memory's VR-1 with electronics.



K factor Transient Response: 2T pulse 2%

Moire: −36 dB Color Bar 75% amplitude, 3.58 MHz subcarrier

Audio Frequency response: ±dB, 50 Hz to 15,000 Hz

Signal-to-Noise Ratio: Down 53 dB at peak operating level (50 dB if dual audio is used.)

Shuttle speed is 2 minutes for a 1 hour tape; lock up time is 1 second nominal.

Ready advantages of the VR-1 recorder include:

• Precise tape tension in record mode—Ideally, tape tension of video recorders must be held constant during record. In the VR-1 transport, the reel servo, controlled by the positional sensor in the vacuum column, insures that the record tape tension is held to within 10% of the set value.

• Precise tape tension in playback mode—In the automatic tape tension mode, the VR-1 recorder will automatically compensate the field-to-field phase error caused by temperature, humidity, mechanical tolerance, aging, and the variation of record tape tension. This eliminates hooking in the picture. In the manual mode, once the tape tension error has been nulled on the tape tension meter, no further adjustment is required.

• Precise tape tension control in the edit mode—Tape tension memory is available, which allows operator to insert or assemble material at the same tape tension as previously recorded to avoid tension transients in the tape.

• Precise tape tension control in the shuttle mode—The tape tension provided by the vacuum column is independent of the tape speed. The VR-1 recorder is the only known available one-inch video tape recorder that can pack tape on a reel uniformly at the tape manufacturers recommended tape tension.

• Gentle tape handling—The vacuum column is the buffler between the capstan and reel. It eliminates the tension impact during start and stop transients to avoid tape damage and allow fast capstan lock-up. The tape storage in the column permits higher acceleration during tape shuttle modes and completely isolates reel disturbances in the head area.

• Immunity to rough environments—The vacuum column does not consist of any mechanical linkages. It is not effected by gravity force, vibration or acceleration.

• Simultaneous record and playback—Record and playback of the picture may be accomplished simultaneously. Thus, playback of the recorded information may be monitored simultaneously with recording so as not to interrupt recording operations.

The capstan controls the tape motion. In other words, it drives the tape by friction at both 9.6 ips and 300 ips. The capstan contacts the back side of tape only thereby minimizing capstan surface contamination and tape damage. Slippage is eliminated by using a special coating on the capstan surface. The entire deck design of the VR-1 recorder reflects the concern for tape care. Vacuum columns control tape tension precisely. The capstan drives the tape gently. All secondary guides rotate to minimize edge damage. Even the primary guides located adjacent to the scanner comprise sapphire rods to minimize tape wear.

Dropouts—dark streaks in the picture—is another

continued on page 48

Puzzle:

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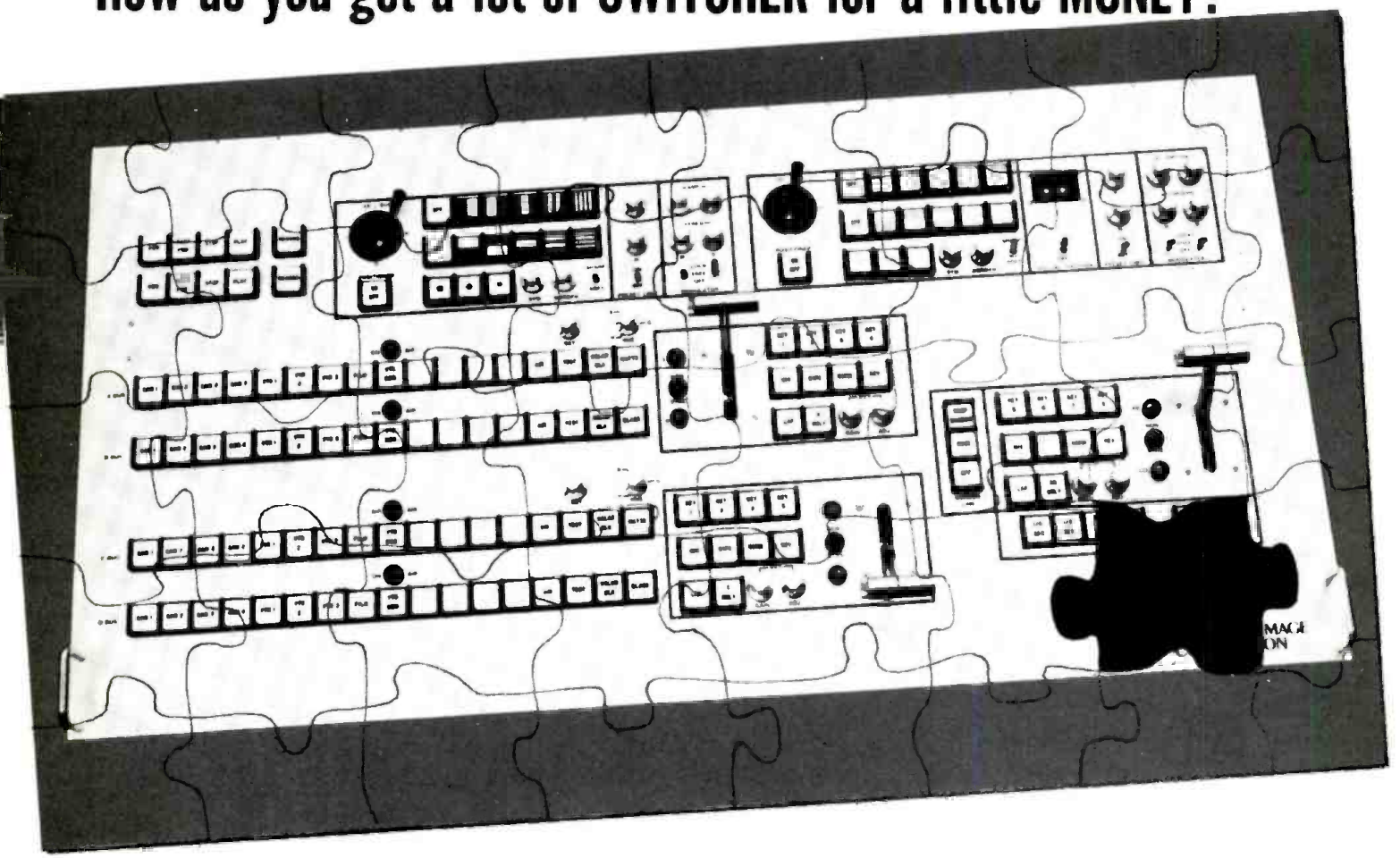

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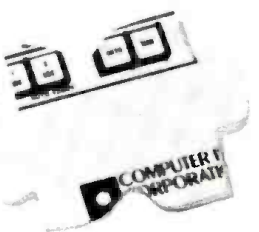

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problem plaguing video tape users. They are the result of tiny specs of oxide or other debris on the tape surface causing a momentary loss of head-to-tape contact. If the loose oxide or debris sticks on to the video head, the result is a head clog. The VR-1 recorder incorporates a tape cleaner which constantly vacuums the tape surface to remove such debris.

As a result, the tape and head life are significantly extended. Most important, the possibility of head clog is minimized to improve the reliability of the recording. The VR-1 recorder is the only known tape recorder on the market with this feature.

An electronic counter, as included on the VR-1 transport, overcomes many of the problems of the older type mechanical counters. It is known that friction introduced into the tape path acts as a tension disturbance. For this reason, mechanical counters are inherently fighting themselves. Good coupling to the counter sufficient to insure an accurate count adds friction to the tape path. Conversely, light friction causes slippage in the counter. The VR-1's electronic counter overcomes these difficulties. Also, monitoring is readily achieved since minutes, seconds and frames are displayed on a large easy to read LED display.

In large installations it is often desirable to operate several VTR's from one central location. The VR-1 transport uses TTL electronic logic control and no mechanical switches or levelers, etc. Remote-control capability is easily accomplished. The VR-1 transport offers remote control of primary functions, remote editing, and remote tape timer. Direct-current motors are used. Thus, the problem associated with non-synchronous line voltages on vans, boats and airplanes is alleviated.

The VR-1 design emphasizes ease of maintenance. The plug-in modular design and ready access to all portions of the VR-1 greatly reduces service time and effort.

Packaged to fit individual needs

The VR-1 recorder is packaged such that the user can tailor the machine to fill the needs of any application without carrying the burden of unwanted features. A complete line of options is offered. For example, the basic cost of the VR-1 is $9400. With options for van applications, it comes to $11,050; with options for mastering, $13,550, not including a time base corrector.

Operating costs for video heads per hour of operation is estimated to be $0.45. Cost of one-hour tape is only $50. Thus the VR-1 is a new generation of one-inch recorder that meets all of todays requirements from both an economy and performance standpoint. It is easy to service, easy to operate and economical to run. We feel the one-inch format can at last come into its own. **BM/E**

The Sony MV-10000 Helical Scan VTR

The Sony MV-10000, a relatively unknown professional 2-in helical scan tape recorder, delivers the high frequency response necessary for direct high band NTSC recording at 7½ ips (writing speed is 900 ips). Its servo-controlled, dual capstan transport minimizes jitter.

Picture performance is claimed to be as good as any recorder regardless of price. Further, the recorder is designed to edit tapes.

This recorder certainly could fill many a broadcaster's requirement. Broadcasters interested, however, will have to seek Sony out. The company's marketing plan calls for concentrating on the industrial-educational sector—presumably Sony feels there are enough contenders for the broadcast market. Nonetheless the features and specs of the MV-10000 will be of interest to broadcasters and belong in this survey.

The MV-10000's full-field-scanning video head configuration virtually eliminates switching transients, color banding and other problems often associated with multi-head systems. The best possible tape-to-head contact (minimizing dropouts) and simplified tape interchangeability is thus assured.

It has two audio channels for stereo or bi-lingual production. Both are high-fidelity, with 30 to 20,000Hz ± 2dB response. The cue channel goes from 10Hz to 15kHz ± 3dB.

Some of the features are:

- Reference sync servo system—permits minimal time-base error, assuring minimum jitter and drift.
- Capstan servo-controls capstan located on take-up side of head drum.
- Tension servo-controls capstan on the supply side of head drum.
- High band FM recording—assures high quality recording and playback, with excellent signal to noise ratio.
- Built in rotary erase heads—permits erasure on field-by-field basis, thus insuring clean inserts.
- Drop-out compensator—replace dropouts with properly matched video information.
- Velocity compensator—permits greater interchangeability of color tapes.

The helical-scan MV-10000 was designed for precise frame-by-frame editing in add-or-insert modes. Because each of the unit's heads (video, sync and rotary erase) cover one complete field with every scan, additions and inserts are clean, with no visible junctions and overlaps or loss of information. Dual audio tracks allow individual insertion of dialogue and music-effects channels. Functionally grouped editing controls near the main operating controls (but carefully distinguished from them by size, shape and color, as well as by panel markings) are simple buttons.

Because of the MV-10000's compactness (only 21″ wide), several machines can be grouped within one operator's easy reach, reducing the need for remote controls. With the addition of a monitor, tapes can be edited without tying up the main console.

Complete servo mode selection ensures precise picture quality in all edit modes. These facilities include a horizontal and vertical lock servo, a head-drum servo that can be switched to compensate for electronic delays in edit mode or for poor sync on damaged tapes, and easy, metered control of output and reference signals.

Sony says the MV-10000's performance, specifications, capabilities, and features are comparable to those of multi-head recorders costing two and three times as much. Precise correction is provided by a

continued on page 65

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Mastering U-matic VTR Adds Edit Capability to Cassette Convenience

By Bob Paulson

The new Sony U-matic VO-2850, a teleproduction editor, the battery-pack portable VTR VO-3800 and new tape, accelerate acceptance of the U-matic format as a news gathering device. Editing features satisfy all teleproduction needs.

Fig. 1. The new Sony U-matic system for editing includes two VO-2850 Mastering VTRs (one for playback, one for record), and the RM-400 Automatic Editing Control Unit.

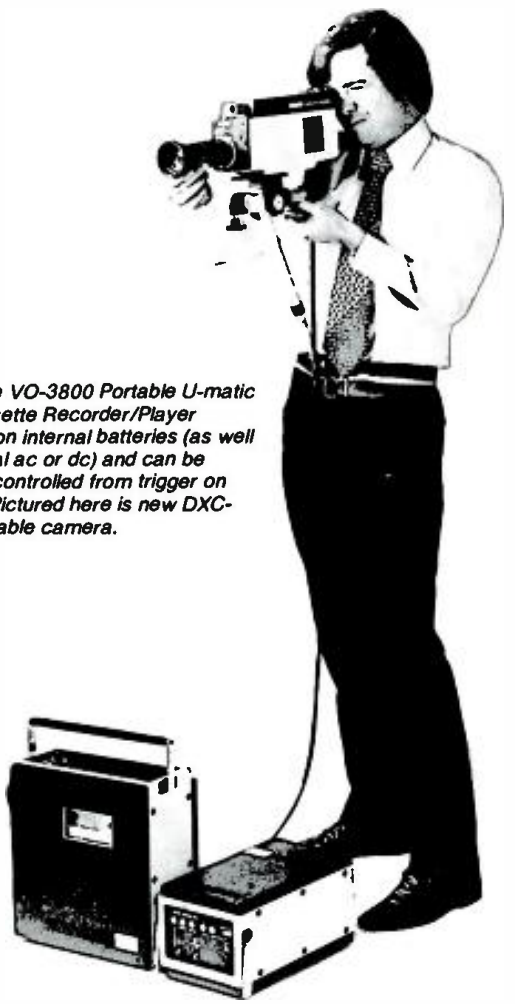


Fig. 2. The VO-3800 Portable U-matic Videocassette Recorder/Player operated on internal batteries (as well as external ac or dc) and can be remotely controlled from trigger on camera. Pictured here is new DXC-1600 portable camera.

A complete, yet simple, U-matic cassette VTR teleproduction editing system (Fig. 1) is now a reality. In conjunction with a battery-operated U-matic cassette recorder and a time base corrector, a cassette system is being used as an electronic journalism system. The components include the new VO-2850 Mastering U-matic VTR with complete audio-and-video assemble-and-insert edit flexibility, the RM-410 Remote Control for operating one VO-2850 from a camera position or switcher, and the RM-400 Automatic Editing Control Unit for precise control of tape-to-tape assemble and insert editing between two VO-2850's. Slow-motion and freeze-frame tape motion modes in the VO-2850 are possible with this new editor.

Rounding the system out for news gathering or field production operations is the VO-3800 Portable U-matic VTR (Fig. 2), which operates from internal batteries, external dc or ac. Its special 20-minute video cassette plays on all other U-matic models. The unit includes a stable sync generator for accurate control of tape and head servos, and can be operated remotely from a trigger on the compatible Sony DXC-1600 portable camera. A dropout compensator and NTSC color recovery system produce high-quality playback and a freeze frame capability permits frame by frame examination of detail.

The freeze-frame review and analysis capability is the result of the introduction of the new KCA series tape. A durable binder system permits still frame reproduction of one track for up to 15 minutes. KCA and existing KC tapes are freely interchangeable among all earlier and the new U-matic models. However, the VO-2850 has an additional smart sensing circuit which prevents slow-motion or freeze-frame operation unless a KCA cassette is in place. This was accomplished by adding a sensor hole to the underside of all KCA cassettes.

These new VTR products make possible portable recording, remote control, and mastering and editing all in the U-matic format.

New U-matic cassette VTR production techniques are the consequence

What the VO-2850 offers first and foremost over

Mr. Paulson is a consultant from Westborough, Mass. The Sony Corp. is one of his clients.

earlier models is clean editing. No longer are we forced to be satisfied only with the programming we can transfer on one uninterrupted simultaneous audio and video pass to a U-matic recorder. This cancels a formerly undeniable advantage of the standard 1-inch formats, and to a lesser degree the ½" EIAJ format, and 8mm and 16mm film.

Three familiar production editing techniques can now be employed while you *master* on ¾-inch cassettes: single camera editing; stop-and-go sequence editing and assemble and insert (Fig. 3).

In single camera setups, for instance (Fig. 3a), the "stop and go" technique so popular in film production can be handled by a single camera operator. Doubling as producer, director, floor manager, and soundmixer from the camera position, a reporter, for example, also becomes the video tape editor by manipulating the control buttons on the RM-410 Remote Control for the VO-2850 (Fig. 4).

Operations possible with this unit include tape preview in normal playback or freeze frame, rehearsing the talent for timing, and making either insert or assemble edits with one eye on the camera monitor and one eye on the pushbuttons. When the function switch on the VTR has been set to the insert mode, the new material laid down on the tape beginning at the edit point may be either video, audio channel 1, audio channel 2, or any combination. Besides conventional "stop and go" assemble editing, other first-generation mastering possibilities now include: adding voice-over commentary on channel 2; pacing to a cue track; synchronizing action and sound to a music track; inserting new video/audio to correct errors; inserting new video/audio to add impact; adding music and effects tracks; adding a foreign language track.

In studio production mastering with the VO-2850 (Fig. 3b), all the same assemble and insert editing applications are available. You can rehearse and record

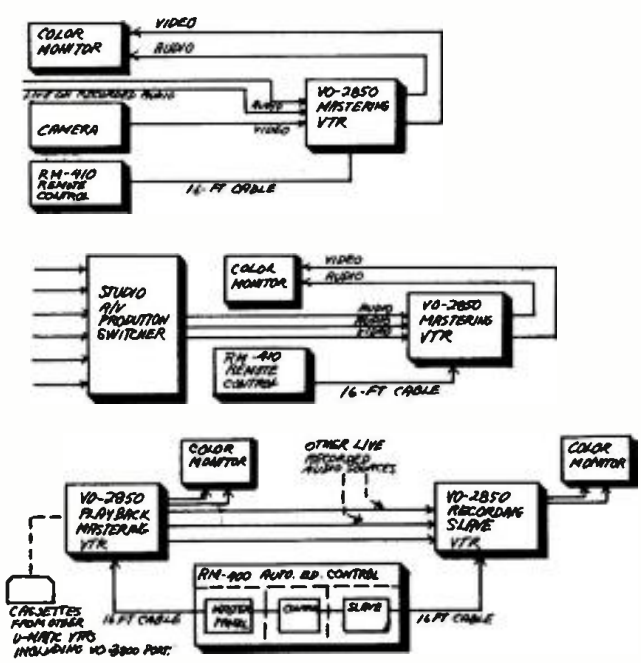


Fig. 3. Editing arrangements for stop and go with single camera (top), rehearse and record (middle), and out-of-sequence recording and editing (bottom).

Fig. 4. Back of VO-2850 showing remote control receptacle.

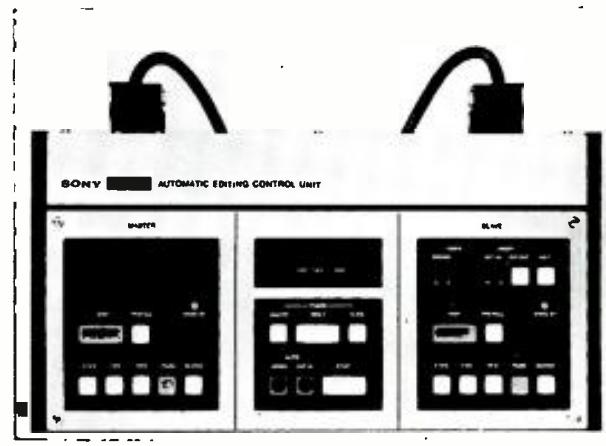


Fig. 5. Close-up of editing control unit. Master controls on left, slave on right, with editing controls in center.

stop and go sequences using multiple cameras and special effects. The VTR operation can be remote controlled by the director or a control room technician.

The VO-2850 really takes the pressure off the talent and production crew. You can cover a fluff or equipment trouble by an appropriate video/audio insert later. Or you can stop and rewind to an earlier audio pause point, and start up again with a new camera angle. Multiple set productions can be mastered in an unhurried manner, with time out between sequences for unsnarling the camera cables, re-setting the lights, checking the graphics and props, and rehearsing the talent.

Finally, you can now even shoot a complex production out of sequence on muliple cassettes, and edit the tapes into proper sequence later (Fig. 3c). Tight control of the editing process and precise, clean editing results are made even easier by adding the RM-400 Automatic Editing Control Unit (Fig. 5). It includes two remote control panels, one for the master playback VO-2850, the other for the slave VO-2850 recorder. Between them is a third panel for automatic control of the actual editing operation, after timing options have been previewed and rehearsed. This panel includes a function for automatically rewinding and cueing each VTR at a point 5 seconds ahead of the selected edit points.

The subjective results of editing on the VO-2850 have to be seen to be believed. The switch from playback to record mode is made during the vertical blanking interval, so there are no visible switching transients. Rotary erase heads erase each video track before new material is recorded. Audio switching transients are suppressed by muting circuitry. The transition is commanded by circuitry which counts control track pulses during the five-second roll period of both VTRs. The tolerance takes into account all worst-case, opposite-direction variations of the two

VTRs during the rewind, cue, and pre-roll operating modes. Typically the edit point precision will be better than the conservative specs suggest.

"Assemble" versus "Insert" Editing

"Assemble" editing is a refinement on the recording technique of the basic U-matic VTR. When you push the record button, a full-width erase head begins to clean the tape of all previously recorded video, audio, and control track signals (Fig. 6), and the video and audio heads switch from playback to record operation.

There are two differences, however. First, in the VO-2850, as in any other capstan-servo'd (V-locked) VTR, in playback the off-tape signal is vertically phased to the incoming video. Once lockup is achieved, and edit can be made at any time without causing a picture roll or breakup.

Second, flying erase heads leading the video heads turn on in the same vertical interval when the video heads switch from playback to record mode. In this way, the picture even in the first frame of the new material is free of noise or residual images from previous recording. Also, two audio channel erase heads turn on to produce a clean, pop-free transition from old to new audio.

A properly recorded "control track" along one edge is the key to editing. This track is a train of precisely shaped and placed magnetization pulses, analogous to the single sprocket holes in 8mm film. If the holes are ragged, or the spacing changes at a splice point, you've got picture troubles.

The difficulty with "assemble" editing is that it's much easier to draw the track patterns precisely in Fig. 6 than it is to realize these patterns on the recorded tape. There's elasticity in the recording tape, wow and flutter and servo oscillation in the capstan drive system, machine to machine differences in the precise location of the control track heads. Therefore, after an "assemble" edit transition the pulses from the new "electronic sprocket hole" maker will be laterally displaced from where the original pulses would have been, had that recording continued. Further, the pulse spacing may be at least temporarily different because of tape tension differences.

On playback this discontinuity and timing change may or may not be objectionable, or even noticeable, depending on your equipment and your application. You won't see anything on a modern fast time constant monitor or home receiver. But if you're trying to dub the resulting edited tape onto a broadcast VTR, you'll have to call for a wide range TBC. (The sync time base stability and/or color subcarrier frequencies on either side of the edit do not meet the FCC specifications for broadcasting.)

"Assemble" editing is simple; you don't have to pre-condition the tape in any way. With "insert," of course, the selected new video or audio material does disturb the remaining original material. "Insert" editing has long been a standard operating mode in quad VTRs. Now it's available in the U-matic cassette VTR, and why its possible is easy to understand.

First let's dispel a misconception about "insert" editing. You don't have to have video material (or audio) on both sides of the length of tape where you

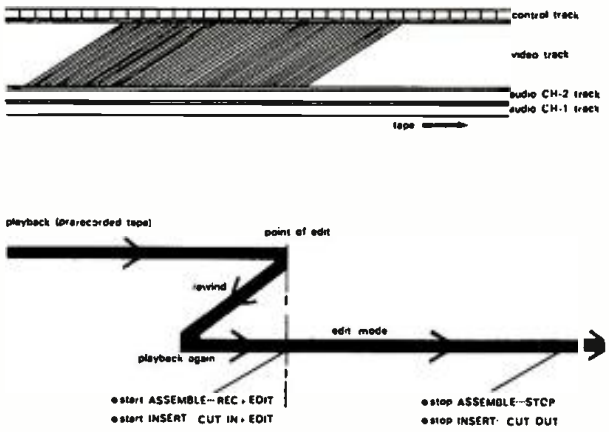


Fig. 6. Videotape format shows control track to aid "assemble" or "insert" edit modes.

plan to put the insertion. But you do have to have a pre-recorded control track along the tape for more than the length of the insert. In the "insert" mode, the new video or audio material is laid down synced in against original control track. That's why you can't erase it.

Once your tape is sprocket-holed from end to end, you can start and stop any place you choose. You can lay down a cue track, and audio track, or video only. Or any combination of the three, depending on how you set the insert mode switches. And change the combinations as you proceed along in the editing session.

Preparing a tape for use in "insert" editing is just like running a roll of film or tape through a sprocket hole puncher from beginning to end. With a cassette tape, you simply run it through any cassette recorder which is connected to a high quality color signal source with clean sync. It's better if you can use a "black burst" source. The video on the tape is then always at black level, and your fadeup and timing coordination is a little easier.

What about broadcasting a VO-2850 tape?

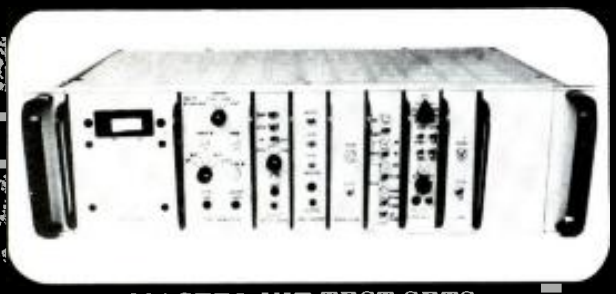
The visible picture quality of a cassette player stands up well in comparison with a quad tape picture quality, viewed on a home receiver. On modern receivers with fast-acting horizontal hold control circuits, there won't be any visible difference in picture stability, either. But without further signal processing time base instability, discontinuities, and sync frequencies make the signal unacceptable for broadcasting.

On a quad VTR playback the signal's time base instabilities are reduced to substantially less than ten nanoseconds total as a result of integral TBC in the quad. This residual jitter represents about $^{3}/_{1000}$ of an inch of picture detail movement on a 19″ screen, and a change in the color subcarrier signal phase which just begins to be visible as hue shift. Also, the corrected signal is put through a proc amp to insert clean sync and subcarrier references from a stable sync generator.

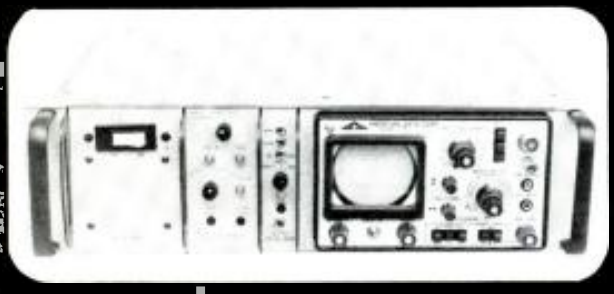
By contrast, the skew tension error in an interchanged cassette tape playback may be 10 to 15 microseconds, or better than 4.5 inches on 19″ screen. Unless the signal has been put through a proc amp,

continued on page 77

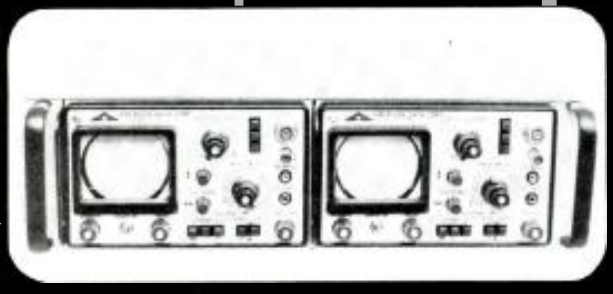
THE ADC 1100



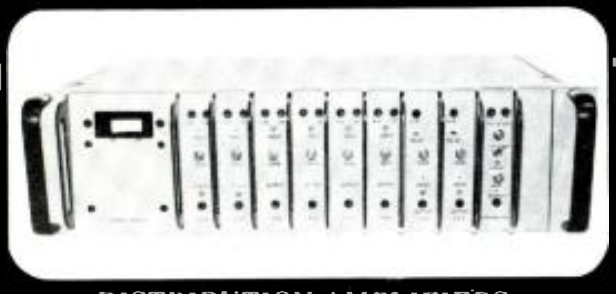
MASTER VIT TEST SETS



COMBINATION TEST SETS



WAVEFORM MONITORS



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1107	Module Extender
1108	Staircase Generator (linearity)
1109	Miltiburst Generator
1110	Sine^2 Pulse and Bar Generator
1111	Encoded Color Bar Generator
1112	Video Distribution Amplifier
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1114	Pulse Distribution Amplifier
1115	Pulse Delay Amplifier
1116	VITS Composite Test Signal Generator
1117	VITS Delete/Insert
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1124	Waveform Monitor
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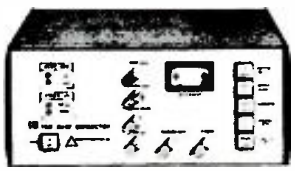

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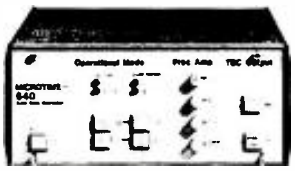

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Tulsa Cable: The Making Of A Super System

A great many eyes are on Tulsa, where cable TV sales—50% penetration—are exceeding most predictions for major markets (Tulsa is 57th). The magic came from offering 24 channels. Only six are regular TV

Can a cable system make good in a community that already has excellent broadcast TV reception? The answer is YES—if the system goes all out. Tulsa Cable Television originates twenty-four plus separate channels—half of them 24 hours a day. Subsidiary of United Cable Television Corp., Tulsa Cable, with a sophisticated computer controlled automatic multiple channel origination system and a lot of know-how—plus new, well-equipped studios and a very creative, dedicated staff—has a lot of people sitting up and taking notice. If what's happening in Tulsa can work elsewhere, cable TV is viable in the major market. What's more, with three educational channels plus another devoted entirely to covering city government activities, cable TV is beginning to live up to its promise.

Tulsa Cable began operations on January 18, 1974, and by November 1st boasted a subscriber count of 21,000, with drops being added at the rate of nearly 3,000 per month.

Tulsa's total market is somewhere around 140,000 potential cable customers, according to William D. (Bill) Swanson, President and General Manager of Tulsa Cable. Penetration in cabled areas is now at 50%—compared with Tulsa Cable's projected level of between 37-42%. Subscribers like what they get. Tulsa Cable reports that disconnects over the past ten months have averaged less than 10% of total subscribers, putting overall retention figures at better than 90%.

Tulsa Cable is building plant at about 50 miles per month which is currently peak capacity for the system. "We'd have been a lot further ahead," says Swanson, "but a tornado knocked out several miles of plant in March—one of the worst tornadoes in Tulsa's history." Tornado or no, Tulsa Cable is moving ahead—fast.

Three years in the planning, this new Oklahoma cable system obviously started off the right way. Marketing programs included a massive publicity effort by parent organization, United Cable Television (formerly LVO Cable, Inc.). The direct sales program is centered around a 24-page, full color brochure entitled, "The Magic of Cable Television is about to Dawn on Tulsa." This brochure tastefully presents the extensive services and programming plans proposed to the community by Tulsa Cable Television.

A potential subscriber learns that he can expect *25* channels of individualized programming—some of them on-the-cable 24 hours a day; improved reception; and even FM radio, if desired. At a modest $5.95 per month, plus a $15.00 channel converter deposit, it seems like a bargain—and it is. Here's what Tulsa Cable is offering:

Three Network Affiliates—KTEW (NBC), Tulsa; KTUL-TV (ABC), Tulsa; and KOTV (CBS), Tulsa

Two Independent Broadcast Imports—KXTX-TV, Dallas; and KTVT, Fort Worth

One Local Educational Broadcast Station—KOED-TV, Tulsa

Two Educational Channels—Tulsa Schools and Tulsa Colleges. Programs produced in studios at the Tulsa Educational Service Center are viewed directly on channel 22. Tulsa Cable is the only cable system currently employing a direct, two-way system between the cable and local school systems' educational studios. On Channel 34, in the future, viewers may elect to watch productions from both Oral Roberts University and Tulsa University.

Religious Channel (automated plus live or tape). A "bulletin board" type channel which provides display of announcements and messages pertaining to community religious events. Information is supplied by the Tulsa Media Ministry. Religious programs produced by various denominations are also presented daily.

Childrens' Channel—Programming from schools and universities; all productions are especially geared for childrens' viewing.

Community Affairs Channel—Available for residents who desire to "air" opinions on civic or social matters. This channel also provides a "bulletin board" (automated) display format for messages advising the community of civic events and public service type announcements.

City Government Channel—Agencies of the Tulsa City government are equipped with complete television production studios and provide program material related to local governmental matters. A microwave link between the city & county's studios and Tulsa Cable is used for live telecasts of public meetings. (See separate box)

Three News Channels (automated). Instantaneous news directly off the AP broadcast wire. Channel 3: News Headlines (24-hour service); Channel 15: News Details (24-hour service); Channel 27: Oklahoma News (24-hour service)

Three Sports Channels (automated). Channel 4: Sports Headlines (wire service sorted; 24-hour ser-

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Most of the material for this article was gathered and written by **Vicki Sagers**, TeleMation, Inc.

vice); Channel 16: Sports Details (stories taken from the AP wire; 24-hour service); Channel 28: Sports Scores (bulletin board type display containing national, regional and local sports scores; 24-hour service). Channel 28 also displays sports programming. Remotes are handled by the system's fully equipped mobile unit and are either taped for later display or shown live via microwave. All News and Sports channels, except for "Sports Scores" are automatically edited for respective topical information by the Programatic 3000 computer.

Weather Channel (automated). Provides current time/calendar weather data, continuously up-dated automatically from TeleMation weather instruments atop the Tulsa Cable studios. Display also includes weather forecasts and reports off the national weather bureau wire service. (24-hour service).

Movie Channel (automated). 24 hours of continuous movie viewing, uninterrupted by commercials. Tulsa offers subscribers a choice of fourteen different movies per week, rotated so that a viewer could conceivably watch a "new" movie, at the same specific time, every night of the year. All movies are displayed on videocassette from Tulsa Cable's T-MATIC™ Automated Videocassette Programming system. Transfers from 16mm to cassette are made in-house. Movies are vintage 1968 or earlier but that hasn't affected the popularity of the channel.

Two Business News Channels (automated). Business stories and financial reports from the AP wire; and NYSE/AMEX stock quotations.

TV Program Guide Channel (automated). A four-hour "Look Ahead," presenting the schedule for all programs on the cable, continuously up-dated by the computer so that program information is current at any given time for the up-coming four-hour period. (24-hour service).

That's 24 channels on the cable now, with one additional planned—a convention/tourist channel offering viewers information on recreational activities, chamber-of-commerce supplied data, and tourist guide type displays. A channel has been set aside for public access but so far there is no demand.

Keeping 24 channels on the system is no easy task. It requires careful planning, sophisticated equipment, and creative personnel. To Production Manager, Hurst Swiggers, "It's a challenge that really keeps up moving."

Tulsa Cable's staff is responsible for providing about 25 hours of local origination programming a

Leon Rollerson gets ready for a taping session. Tulsa Cable uses IVC color cameras and 1 in. VTRs.

Don Jones operates TeleMation production switcher during one of the system's regular programs.

24-hour continuous movie displays and other videocassette programs can be handled automatically. Each player can be automatically started and stopped from the computer.

Anne Higginbotham, Tulsa U "intern-operator" enters daily TV Program Guide up-dates into computer memory. Using a tele-typewriter, she will have a "hard copy" reference of the entries.

week with some regular programs live or taped from their fully-equipped color studios or mobile unit. Close to 50% of these productions involve sports—Tulsa Cable has produced over fifty sports remotes since January.

One-half of the multi-channel operation is generated by a TeleMation Programatic 3000 computer controlled automatic origination package. According to Swiggert the system is extremely easy to operate. Employing four full-time "operators," most of whom are "interns" from Tulsa University's educational media center, Swiggert claims new recruits can learn to operate the computerized system within a one-week training period. A typical operator's day may be split up among various duties, including data entry for those automated channels requiring daily up-dates such as the TV Program Guide, Sports Scores, or special announcements for any of the system's "bulletin board" type channels. The operator is also responsible for checking audio levels on all channels carrying background music; making sure videocassette programs are on-line as scheduled; regularly spot-checking all channels for performance status; and helping as needed in studio production.

Why did Tulsa Cable choose the computerized automatic channel approach to offer their subscribers the widest variety of programming available on cable anywhere in the country? Management says it's an excellent solution to multiple channel local origination—at a reasonable cost.

United Cable Television is currently beginning construction on two new systems which will be formatted similiarly to the Tulsa operation. Their Albuquerque (New Mexico) and Hartford area (Connecticut) systems will both include TeleMation Programatic 3000 multi-channel computer packages and will offer subscribers the same kind of individualized, viewer-interest automatic services, along with regular programming.

"We feel our automated channels are certainly an important part of the overall cable service package," says Greg Liptak, UCT's Vice President in charge of Marketing, "but agressive, well-planned marketing and operations expertise are as important as the services you have to offer."

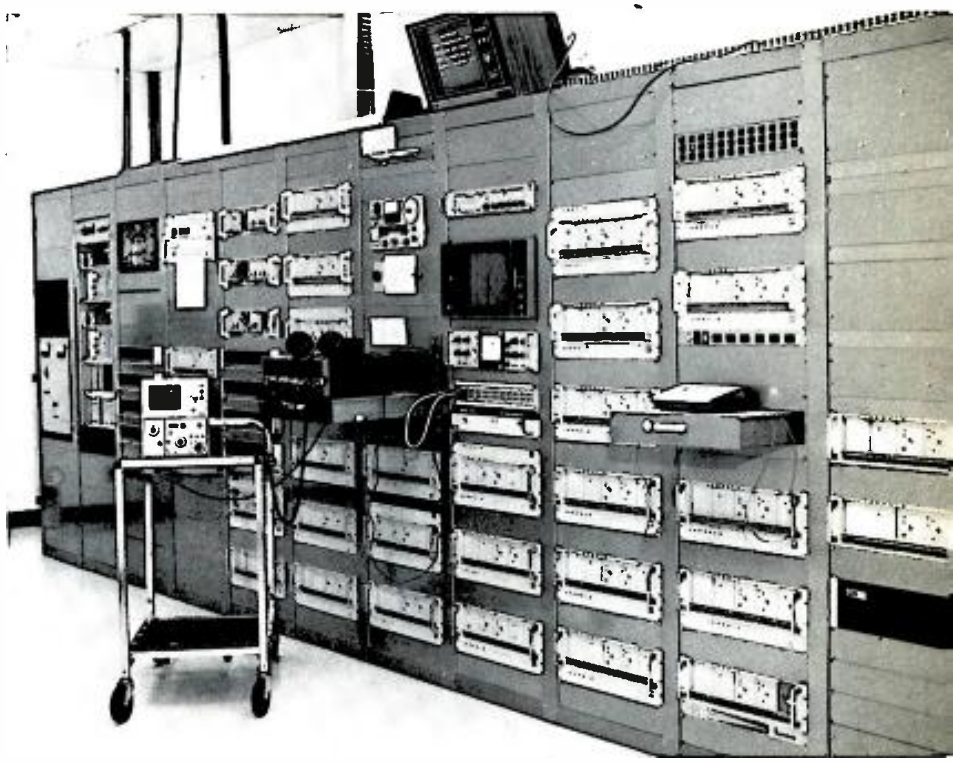
Marketing before and after

Subscriber handling from point of initial contact through installation is a well planned, smoothly-exe-

continued on page 60

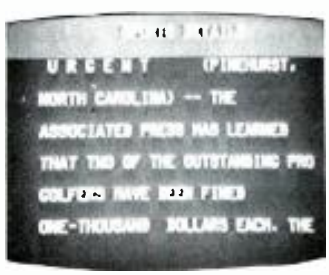
President Bill Swanson feels CATV systems need finely integrated packages of program and marketing services.

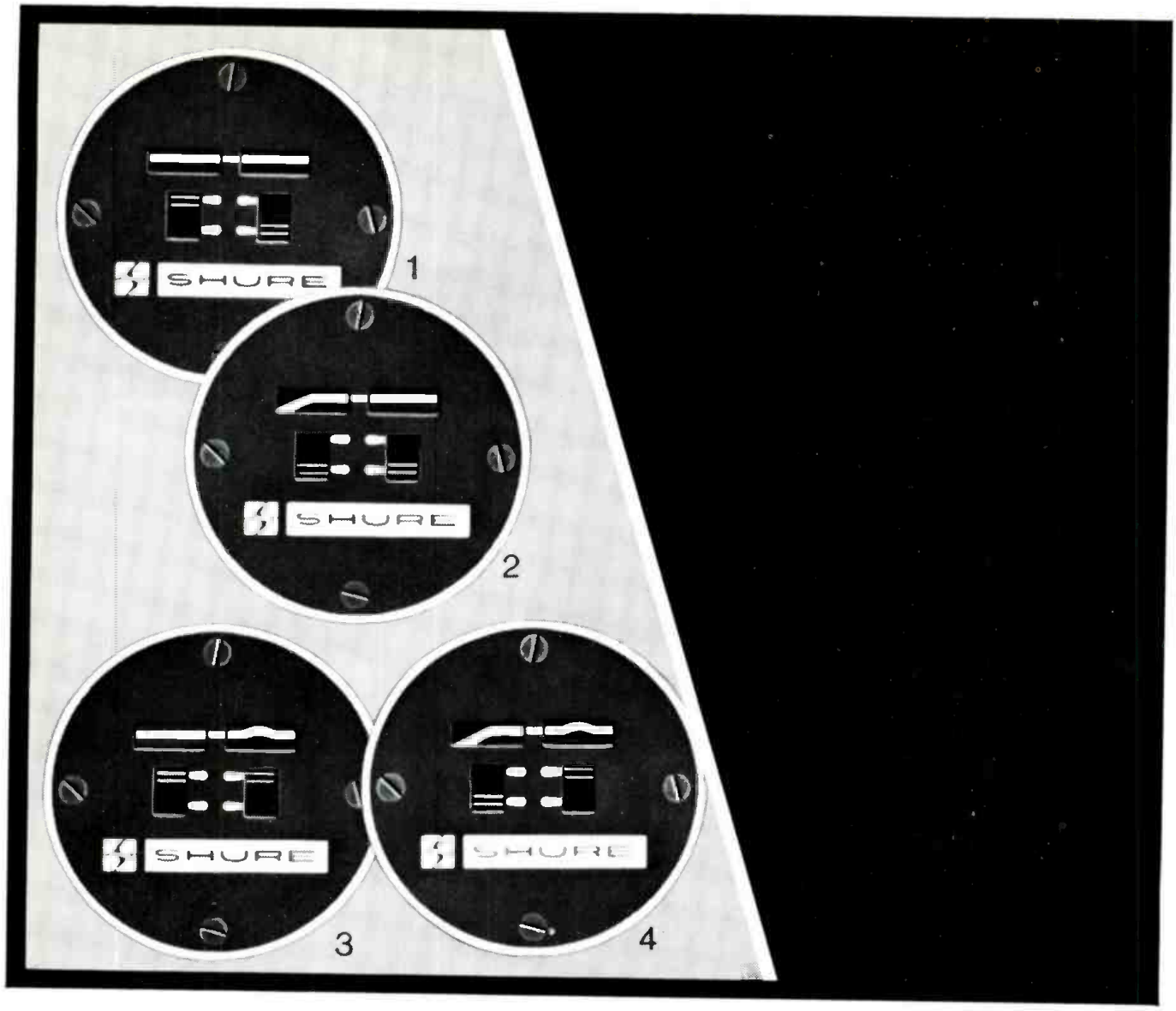
Production Manager, Hurst Swiggert, says movies, weather and sports scores are the most "popular" of the automated services.



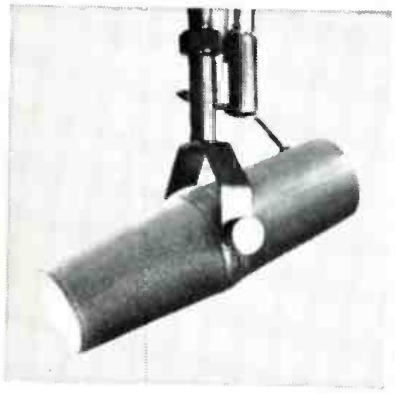
Tulsa Cable's all-Jerrold headend distributes the system's 24 channels to over 21,000 cable subscribers.

Typical automated displays generated by the character generator and controlled by mini-computer.





What you see is what you get.



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cuted professional marketing process. As cable construction reaches a new district, all potential subscribers (previously identified and classified by the Marketing Department) are personally contacted. If a sale is made, no later than 20 days after installation, a Tulsa Cable PR girl—attractive, uniformed and specially trained, calls upon the subscriber to see "how things are going." She checks the service, can make minor converter and/or color set adjustments, and notes feedback from the customer regarding his satisfaction (or dis-satisfaction) with the cable service. If she finds problems on the cable, they are corrected within 24 hours (a service offered seven days a week, at no charge to the customer). If all aspects of the service are satisfactory, she reports this condition too. "A lot of trouble is taken to insure the subscriber's complete satisfaction with the cable," says Swanson. "For instance, if problems are encountered with a subscriber's color TV set, we don't just tell him that it's his set and not the cable—we show him. And we encourage all of our subscribers to report problems promptly; then we make every effort to remedy the trouble that same day. We feel that good customer service and PR really pay off and are important to the system's overall success."

Jerrold set-top converters are used to pull in the 24 channels. All signals are processed through Jerrold headend equipment. **BM/E**

31—The City Government Channel

Tulsa is one of the few communities that has devoted real resources—equipment and people—to the operation of a government channel. In Tulsa this means both the city and the county. A complete production studio is located on the premises of the Tulsa City-County library. Cost of the studio at the library and equipment came to over $110,000. Staff consists of two-full time persons and two part-time persons. Annual operating budget this first year was $56,880 not counting some services supplied at no charge by the library. Director of the program is Tom Ledbetter.

What happens on a city-government channel? First major agency to use cable TV was the Health Department, which prepares one program a week. Thrust of this programming is primarily educational. Shortly after the cable system commenced operation, Channel 31 began covering meetings of the City Commissioners which are held twice a week. This is a major activity since the average meeting runs about two hours. Occasionally a meeting lasts five hours. The longest ran 5½ hours when a battle over a zoning matter came up. These programs are produced live but also taped for repeat two or three times a week. There is no editing performed. Live feed goes from city hall to the headend via a microwave channel. Tapes for later play are delivered by hand to the headend.

Another extensive user of the city channel is the Parks and Recreation Department. The Zoo is a popular shooting location, followed by flower gardens. Some of the Parks and Recreation programs deal with, and promote, arts and crafts.

There are about 50 agencies that could be the source of programming. Ledbetter reports that about half of this number have been contacted so far.

After nearly a year of such programming, what is the outlook? Ledbetter remains optimistic and he is pleased with the support he is getting from the city fathers. It's a time consuming job to explain the potential of cable TV programming to agencies who have traditionally not been media oriented, but the staff has run into no major roadblocks.

More equipment and staff would be a help. Trouble with equipment is the biggest frustration. When CM/E called, one camera was down and this curbed operations. A time base corrector is a must. Right now channel 31 plays some tapes in the early morning when a TBC can be borrowed from Tulsa Cable. A more sensitive camera would be good for cablecasting the city council meetings since the commissioners do not want lights facing them. Ledbetter may switch to black and white coverage so that a sharper picture can be transmitted. Extra equipment to leave at City Hall would be desirable because of the wear and tear in moving everything in and out twice a week.

View of studio at the library.

Right now Channel 31 programming is on the cable about 12 hours a day—from noon to 5 p.m. and then again the next morning from 3 a.m. to 9 a.m. No, Tulsa does not have a large graveyard shift population—it's just that those wee morning hours are attractive because of the availability of a TBC. When the channel gets its own TBC it will do some programming during prime time evening hours.

Another major piece of equipment will be used early this spring that will increase programming hours. The library is getting a Systa-Matic "electronic juke box" which will play video cassettes automatically. Hopefully this unit will operate unattended on week-ends. The same system can scan a series of card visuals and Ledbetter hopes to put employment openings on the channel when the cable would otherwise be dark. Channel 31 also has on order one of Eastman Kodak's Supermatic film video players.

For next year, Ledbetter will try to increase his staff by one more full-time person. He needs a full-time technical engineer because keeping equipment running is a big job. This will free another person for more production.

Is anybody watching? No attempt has been made to measure or guage viewership. The city council likes the idea of its sessions being televised. If the microwave is out, people do call in complaining. There's evidence that at least a few people are watching and that's sufficient for the moment. Ledbetter would like to see an evaluation made but since the cost for that would be a major budget item such research will have to wait.

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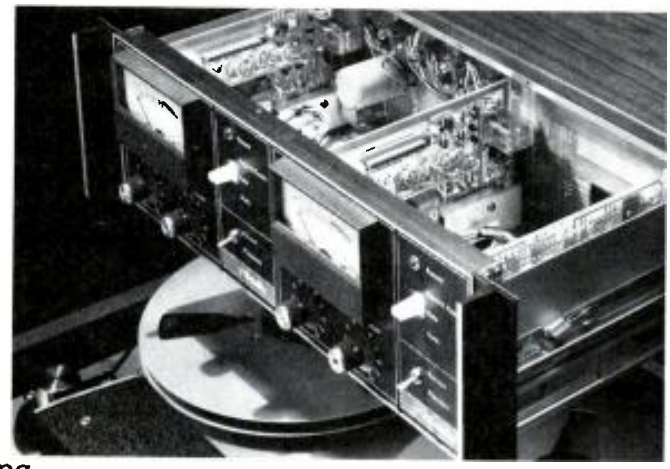

Why make the job of recording tougher than it has to be? Operating a recorder/reproducer is so easy with solid state control switching, plus straight line threading for fast editing. A motion sensing system like OPTAC™ which helps prevent tape spill or damage. And you don't even have to use the stop button when changing transport modes.

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And why be an acrobat when it comes to adjusting and maintaining equipment? All that bending and reaching can be eliminated with a pull-out control drawer that houses the mother-daughter boards to give full access to all set-up and equalizer adjustments. Would you believe no extender boards needed?

You enjoy this convenience in the 280-B, too.

But to really take it easy on the job, you need assurance that sound is being recorded to perfection. So we made sure that the efficient, clean-looking electronics of the 280-B deliver the goods — and then some.

An outstanding S/N ratio assures cleaner sound in progressive generations.

Up to 72dB on full track .25" tape at mastering speed. And 68dB on two-track .25" and four-track .50".

Flat frequency response usually exceeds published specifications: ±2dB, 30Hz to 18kHz. You'll find reliable selective sync switching in the 280-B, with sync response equal to normal play response. But you won't find noisy push-buttons in the audio circuits. For easy insert, our function switch provides the ability to punch "in and out" of the record mode on any channel without disturbing tape motion.

The payoff is a superior end product — the perfect tape. And for long-playing tapes, the 280-B is now available in a 14" configuration. Clearly, this recorder/reproducer provides your transmitter with a perfect recording. When recording masters, the result is just as outstanding.

So get the facts. Then get the best — at a reasonable price. Contact your Scully/Metrotech field office in Los Angeles (213) 387-4252, Nashville (615) 244-1546, New York (212) 354-0623 or Chicago (312) 583-7878 for details on the 280-B series with up to 4 channels, or write: Scully-Metrotech, 475 Ellis Street, Mountain View, California 94040. Telephone (415) 968-8389. TLX 345524.

Scully|Metrotech
Division of Dictaphone

Designers and manufacturers of a full line of tape recorders, reproducers for broadcast and master recordings, super slow speed voice logging recorders with time generators and readers.

Circle 131 on Reader Service Card

Innovative Delivery Techniques Described at NAEB Convention

The ATS-6 2500MHz educational satellite now serving the Rocky Mountain area, Appalachia and Alaska received a great deal of pre-convention publicity (see BM/E November) and indeed delegates were able to witness actual satellite transmissions. The notion of a permanent U.S. educational satellite (the ATS-6 will move to India next year) intrigued educational broadcasters as a bountiful delivery system but it was not the only technological innovation to promise effective use of the electro-magnetic spectrum.

There was a resurgence of interest expressed this year in SCA, as an adjunct to FM broadcasting and several technical and general sessions were devoted to that theme. In the exhibit area a novel way of transmitting coded information along with a TV picture was depicted by Atlantic Research Corp. Called Data-Dot, the system permitted data services to be present as a "dot" on standard TV screens; an optical transducer in the form of a suction cup which could be affixed to the CRT tube face, picks up data for decoding.

All kinds of data could be transmitted this way—including titles for the deaf—but more on this later. Still another method as a means of getting more information out of available spectrum was shown at Las Vegas. Making a debut was an audiovisual distribution system called VIDAC (Video Audio Compression). Its a compressed time variable rate scheme by Westinghouse. By sacrificing some of the unnecessary motion contained in most TV, VIDAC makes it possible to deliver hundreds of programs on a single TV channel. Westinghouse engineers and educators from the State of Georgia, where the new development has been field tested, described the system and suggested some of the uses to which VIDAC could be put.

The system is built around the conventional NTSC system of transmitting 30 frames of picture information per second. But in using only as many visual frames as are necessary to present still pictures to illustrate a lecture and by allocating other frames to carry compressed audio, the result is a time compressed version of the lecture that can be transmitted in a small fraction of the time required to view the program. Up to 16 seconds of audio per TV frame is employed.

During viewing the single picture-frame transmitted is made to reappear on the screen a sufficient number of times for the eye to pick it up. (Process is similar to movies, frames are repeated.) A disc memory incorporated in the terminal at the receiving end captures the picture material and compressed audio for playback.

In essence then, VIDAC transmits a program consisting of a varying combination of pictorial and audio information over the air (or via cable) 30 frames a second. Thus a four-second 120-frame transmission could consist of 15 minutes of audio accompanied by 60 frames of pictures. (Fifteen separate 15-minute presentations can be transmitted in a one minute station break.)

In practice, the audio and visual information is multiplexed and compressed in a processor and stored on regular videotape until air time. At the receiving end, the signal is captured and recorded, this time, on a magnetic disc. The disc has separate heads to pick up picture info and audio. Signals are sent encoded and the heads function in a coordinated way to present the visual and audio information properly synchronized.

In the time compressed form prior to transmission, sixty inches of videotape is sufficient to store a 15-minute illustrated lecture. A one hour reel of tape stores one thousand 15-minute programs.

A wide variety of operating systems are possible with VIDAC creating a new type of audio-visual network. A few of the possibilities: An educational television station or network could serve as an audio-visual distribution system using a single resource library. Any urban or rural school, hospital or public institution within the reception area could select programming from that library and have it delivered to them using only a few seconds of transmission time. A centralized audio-visual library at the head end of a cable television system could serve individual schools, hospitals or other public institutions with individualized instructional needs yet only use a single channel of television to do so. A university campus instructional library could provide classroom or student learning carrel access to audio-visual material when assigned as an integral part of college courses.

While the receiving terminal can store only two programs on a disc, additional programs could be recorded on video cassettes for local distribution.

The Georgia ETV network has found the costs of producing VIDAC program considerably less than standard TV. Visuals are inserted electronically using slides, pictures or drawings, film strips, etc. Teachers can produce their own lectures.

Of extreme interest to schools is the fact that one A-V library can serve an entire system with VIDAC. Projecting this concept on a national scale, one can envision a national library serving schools everywhere. The Public Broadcasting System network, for example, could transmit thousands of programs every night after sign off. Those seeking a particular program could simply set their recorder to capture only those programs carrying the desired identification number. Although the receiver terminal now costs in the vicinity of $20,000, this could be reduced in quantity. Westinghouse experts feel VIDAC could be a less expensive way than mail or air express for delivering films. Getting a hard copy to a user destination and back

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Edutron introduced $2900 TBC.

Digital Video Labs had $15,000 TBC.

Broadcast Electronic's new economy line of cart machines.

Panasonic cameras, left; Data Dot printer, below.

Other NAEB Highlights

Financing

• Public broadcasters are closer than ever to obtaining long-range federal financing that is insulated from political pressure. However, the funding bill—which is now before Congress—still has "a long way to go" before it becomes law. For every $2.50 that public broadcasting obtains from nonfederal sources, the Corporation for Public Broadcasting would receive one dollar of federal support, up to a specified ceiling. Additionally, appropriations from Congress would be for a period of five years.

Ford Foundation

• The Ford Foundation, which has contributed $273 million to the development and growth on the non-commercial broadcasting industry since 1951, received a Distinguished Service Award from the National Association of Educational Broadcasters.

Buckminster Fuller

• Scientist-philosopher-architect R. Buckminster Fuller addressing the NAEB said "This is an extraordinary new moment, for we now have enough knowledge so that by 1985 we can take care of all humanity." Fuller said a special mission of public broadcasters is to "see how soon we can get all men to think in large patterns, and not to be overcome with local obstacles." Fuller believes that mankind can get "more out of less," through science and that the limits-of-growth prophets are wrong.

Satellite Technology Demonstration

• Gordon Law, project director, said "When future satellites are launched—as they will be—and these satellites are made available to educational broadcasting, a spirit of cooperation among potential users must manifest itself." He stressed the importance of working together to maximize the effectiveness of new satellite technology.

• Philip A. Rubin, director of Engineering and Research, CPS, predicted that PBS would be the first broadcast entity to be served by satellite. In other engineering sessions PBS reported progress in improving audio services. AT&T longlines is committed to an improvement.

now costs $3 to $6.

While VIDAC is compatible with NTSC transmission systems, the actual information occupying each time frame is processed in a special way. The DATA-DOT system from Atlantic Research, on the other hand, adds data to an otherwise normal TV transmission.

To the eye the dot appears as a rapidly and randomly blinking light source. It is this blinking (modulation) of the light level which carries the information. All that is needed at the receiving end is a means of precisely detecting the light pulses and converting the digital data back to their original form.

The dot is created by a unique special-effects signal generator located at the televison station. Known as the Data Insertion Unit (DIU) and keyboard. The Model 666 DIU is capable of inserting a single channel of data.

The video signal from a television camera is routed through the DIU. A black or blinking border also is created within the DIU. Controls surround the dot and permit placement of the dot at any location on the television screen.

Incoming information is picked off the screen by a photo transmitter in the Data Detector. The detector is held on the glass by the small suction cup attached to the detector case. An opening in the center of the suction cup permits light from the dot to strike the sensor. The Data Detector feeds a Responder and mini printer on other display devices.

A device is designed to permit and encourage a student to respond to questions posed by the instructor in the television studio and to know instantly whether his answer is correct or incorrect.

The student responds by pressing one of the twelve symbols on the Responder keyboard. As he does so, one of the two light-emitting diodes (LED) above the keyboard will begin to flash. These LED are labeled YES and NO, corresponding to whether his answer is correct or incorrect. If the answer is incorrect, the student can select a new answer until he determines the correct one.

A mini-Printer has been designed especially for use with the Data-Dot system. It is, however, compatible with many other digital data systems. The Model 111 mini-Printer format provides 18 alphanumeric characters per line. Examples of outputs are news bulletins, answers to quiz questions, and weather summaries. Many other types of messages can be adapted to the mini format.

The use of such TV reception techniques permit hundreds of "non visible" data channels to be placed anywhere on the periphery of the screen. Through special receiving techniques, these data channels are available to a wide variety of users—educators, government, industry, commerce—without disturbing normal public viewing.

Cable TV

• James R. Ludwig of Flathead Valley Community College, Kalispell, Montana showed how Cable TV could be used for educational and community service programming. Ludwig outlined and showed examples of the college's "Total Community Education" program.

Women

• A national task force has been established by CPB to investigate the role and image of women in public broadcasting. Currently only 27.1% of total full-time employees in 1972—the last year for which figures are available—were female; and, of these, 79.02% held clerical, secretarial, manual and custodial jobs.

Minorities

• An advisory panel to the NAEB recommended an evaluation of program co-ops and questioned whether they were limiting freedom of expression. In many cases minority expression was voted out, Dr. David Berkman said.

Research

• Dr. Stephen L. Yelon, Michigan State Univ., outlined criteria for "grabbing" kids' attention: functionally relevant activity on the screen pertaining to the segment on the screen; strong rhythm or rhyme; on stage correction of performers making mistakes; children on the screen; and a comprehensive spoken script to accompany the visual product. Long message monologs and performers competing with visual words or phrases on the screen, do not maintain children's attention.

Telecommunications

• The "symbolic interchanges" offered by telecommunications can and must replace a greater percentage of the physical encounters now serviced by physical travel. This was the consensus of one group meeting at the NAEB. Dr. Gerbard J. Hanneman, Annenberg School of Communications, projected that in the future when telecommunications takes a greater share of the message moving market there will be dramatic shifts in population with the advent of decentralized, desirable located, shopping-center type offices. Business travel may not be replaced as much as expected, though, others hypothesized based on surveys of business travelers.

Atlanta Research Corp. speculates that the mini printer, while not cheap (it's still over $1000 in small quantities) might actually pay for itself. Advertisers, for example could offer Data-Dot customer discount coupons over the air. Since the cost of the distribution is cheap, both the advertisers and the customer wins.

Other Exhibits

The exhibitors at NAEB were down in number but a few brand new items were revealed. Two were the new time base correctors—a top of the line unit with a wide correction window from Digital Video Labs of Toronto and a bottom of the line unit from Edutron, Gainsville, Fla. The later is a shift register type which costs less than $3000. Also in the TBC category, Ampex announced that its unit could now work with hetrodyne VTRs.

Among other "firsts" was the showing of a new line of low cost audio tape cartridge players by Broadcast Electronics; a new color film camera chain with more automatic features (the 1550) from Cohu; a new tower flashing light system from Flash Technology Corp., Nashua, N.H.; a new modified Panasonic (or Concord) video cassette unit from National Video Corp, of Glendale Calif., that could slow scan in both forward and reverse directions to make editing easier; a new camera from Philips and a new cross pulse generator and other video accessories form Video Aids of Colorado.

Many of the exhibits were devoted to program services and several showed mobile production facilities—Thomas Washburn, Santa Cruz, and Mobile Systems Inc., Minneapolis. Conspicuous by their absence were large exhibitors of previous years, principally TeleMation, Sony and IVC. Their demise at NAEB along with that of other exhibitors meant NAEB, which nearly rivaled NAB in size a few years ago, is now not even a complete closed-circuit TV show. New first-time exhibitors to NAEB, however, did make the show interesting.

In addition to those already mentioned, were Industrial Science Inc. with a line of production switchers and accessories and Television Research International with its "easy-as-film" editing system, the EA-5 (see separate article on CITY in the January issue on news gathering.)

VIDEOTAPE RECORDERS

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built-in, double-heterodyne color-phase stabilizer including velocity compensator.

The MV-10000's full-field recording system eliminates the need for automatic, individual-head color saturation compensators.

Because of the low, 900 ips, writing speed, the time between head changes is exceptionally long—more than 500 hours (the tape floats on a thin layer of air to reduce friction). Because of the MV-10000's one-video-head-plus-one-sync-head-per-field scanning system a new head can be installed in about five minutes, with all alignments completed in 30 minutes. With only half (or less) as many heads to change, parts costs are reduced as well.

A few key specs are as follows:

Video bandwidth: 30Hz to 4.0MHz ± 1dB; less than 3dB at 4.2MHz.

Signal-to-noise ratio: Better than 52dB weighted (46dB unweighted) p-p Video signal to RMS noise.

Time base error: Jitter: less than 0.5 microsec. peak to peak; Drift: less than ±0.5 microsec.

Color moire: Better than 36dB down measured with color bars of 75% saturation.

Recording time: 93 minutes (10 ½ inch reel).

Audio bandwidth: 30Hz to 20kHz (CH-1 and CH-2) ±2dB.

Audio signal-to-noise ratio: Better than 50dB (CH-1 and CH-2).

BROADCAST EQUIPMENT

Video test transparencies are produced on a clear acrylic plastic base, with a direct reading emulsion. The line of geometric test patterns fits into an 8″ × 10″ light box, and eliminates glass distortion. The patterns available are: Resolution, Linearity, Registration, Multi-Burst, Chess Board, Window, Line Focus and Depth of Modulation. TELECOMMUNICATIONS INDUSTRIES LIMITED. **300**

Intensified silicon-vidicon (ISV) television camera tube, designated S7000, is for low-light-level TV systems. Sensitivity is 300 μA/fc, and resolution is rated at 30% modulation depth at 400 TV lines per picture height. Usable output signals are produced at light levels as low as 5×10^{-5} fc. AMPEREX **301**

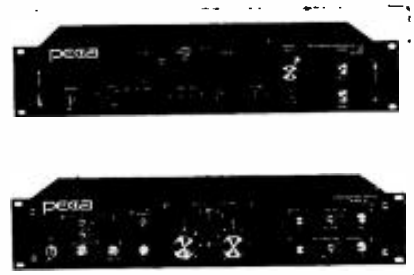
Quadruplex video cassette is used with the Ampex ACR-25 broadcast recorder-player. The cassettes are available in one- and three-minute versions. Dust covers are optional. 3M COMPANY **302**

Color Encoder/Auto Balance/Image Enhancer, Model 9900, combines these three instruments into one. The instruments are also available separately. VIR insertion capability is provided. Detail on/off, detail gain, burst remote control are standard features. The encoded signal meets all NTSC, EIA, and FCC specifications. COHU **303**

Zoom lens has range of 10-150 mm, is for the 16mm cine film camera. The lens can focus down to 32″ from the image plane while still retaining zoom capability. A field size of 1″ × 1⅜″ can be focused upon while leaving a working distance of 24″ between the front lens and the object for lighting and camera manipulation. $2850. ANGENIEUX CORP. **304**

Crimp tool is designed to crimp the rings on RG-59/U and RG-6/U cable. The tool measures 2½″ × 8½″ and fits in the CATV installer's tool belt. The die used for crimping RG-59/U is 0.262″ and 0.324″ for RG-6/U cable, on a flat-to-flat measurement. $27.50. UTILITY TOOL CORP. **305**

CATV test system features a sweep receiver with an output bandwidth up to 25 times greater than conventional detectors operating at the



same RF level. The system consists of a simultaneous sweep generator, and sweep recovery receiver(s) located at remote amplifiers or in mobile vans. The receiver has a detector rated at 260 kHz and the 1-440 MHz sweep generator is flat to within ±0.25 dB. $1048 for the receiver and $675 for the generator (in unit quantities). PECA. **306**

Relative power monitor, type 5478, is a passive sampling unit. It provides two voltage outputs representing forward and reflected power in 50-ohm transmission lines. The type 5478 operates in the 80–500 MHz range; the 5478A covers 500–900 MHz. MOSELEY ASSOCIATES **307**

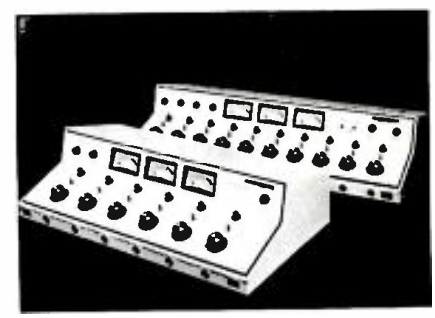
Shielded cable clip protects conductors in a cable from a current surge of 1000 amps for up to 20 seconds. The Bullet Bond Clip 1000 features a wrap-around tail on the clip's shim plate to make contact between the cable shield and bond bar or other grounding conductor. An insulating shield has also been added to protect underlying conductors from high current surges. COMMUNICATIONS TECHNOLOGY CORP. **308**

Continuous-belt magnetic tape eraser removes recorded audio digital or video material from any 7″ reel, cartridge or cassette in a single pass. About 4 seconds is required for the tapes to travel the length of the belt. GARNER INDUSTRIES. **309**

Air dielectric coaxial cable is available in 3″ size, and features a corrugated tubular copper center conductor, polyethylene dielectric, corru-

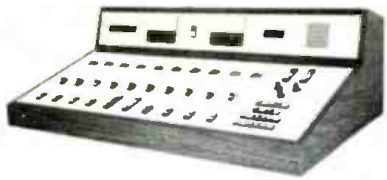
gated outer conductor and a black polyethylene jacket. Impedance of the cable is 50 ohms. Attenuation at 100 MHz is 13 dB/100 ft.; average power capability at 100 MHz is 35.9 kW. CABLEWAVE SYSTEMS, INC. **310**

Six-channel and 10-channel audio consoles feature integrated circuit phono preamps, shielded plug-in modules, 15-watt rms monitor output, remote control functions, and bottom or rear cable entranceways. Consoles in this series are wired for



both monaural and stereo by adding the needed plug-in and/or transformers. Both versions come with stereo input attenuators that control the left and right channels simultaneously. COLLINS. **311**

Audio console features ten channel, dual monaural operation. Two microphone channels, two turntable channels, automatic cartridge switching on two channels are features. A digital realtime clock and elapsed timer with automatic reset and start are included. Price of the



MA-31 is $6995. DYMA ENGINEERING. **312**

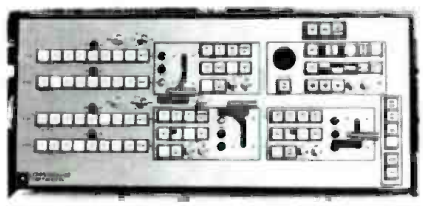
Video character generator and multipage message store offers eight sizes of both upright and italicized characters, two-page memory, computer data interface. The model VCG1 character generator blackoutlines the 52 characters provided: 26 letters, 10 numerals, 16 symbols. Words may be displayed in up to 5 colors, and are stored in a floppy disc at TTL levels. ASTON. **315**

Special effects generator features more than 4000 patterns available from the controls, plus spotlight, fan or rotary wipes, control via computer, memory or from control panel. The type 7100 is expandable to generate extra patterns such as stars, binoculars, keyhole, hearts, origami wipes, etc. Available options include Positioner, Pattern Modulation, Color Matte, and Black or Colored Edging. EMI. **316**

Self-contained TV cable tester performs continuity test of up to 99 conductors in one second. Model AS-99-DO checks for shorts, opens and miswires in cable assemblies up to 10,000 feet long. ADDISON. **317**

Retrofit ferrite heads for video recorders are warranteed for a year or 1000 hours of use. The heads are designed to fit Ampex VR660B and VR660C helical scan recorders. $220 and $275, respectively. SPIN PHYSICS. **318**

Video controller (switcher) features eight to 24 inputs, linear keying with adjustable gain and clip level, soft or border edge wipes, additive(lap) and non-additive mixing, non-sync inhibit, split faders, and computer compatible control inputs. Options for

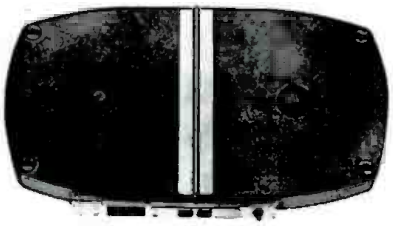


the model 4081 controller include 105 effects and positioner, audio follow video, linear chroma key, output proc amp, etc. COMPUTER IMAGE. **319**

Cine film magazine holds up to 400 feet of 16mm stock using the Mitch-

continued on page 68

ell-type system. The PLC-4 is made from Lexan®, eliminating the problem of magnesium-particle contamination of the film bath. Hinged doors have a triple step light trap to guard against light leaks. $160. CINEMA PRODUCTS. **320**



Sweep/signal generator covers the frequency range of 0.5 to 300 MHz. Flatness is ±0.25 dB. Output amplitude is +60 dBmV maximum with a total attenuation range of 90 dB. Model 1001A costs $1,100; model 1002 (1.0 to 500 MHz) costs $1,150. WAVETEK. **321**

Cable TV trunk station is part of a line of less expensive CCTV system components. Device shown is two-way convertible, has a bandpass of 50 to 220 MHz and has capacity of 23 channels. Trunk stations in the series are spaced at 34 dB. C-COR. **322**

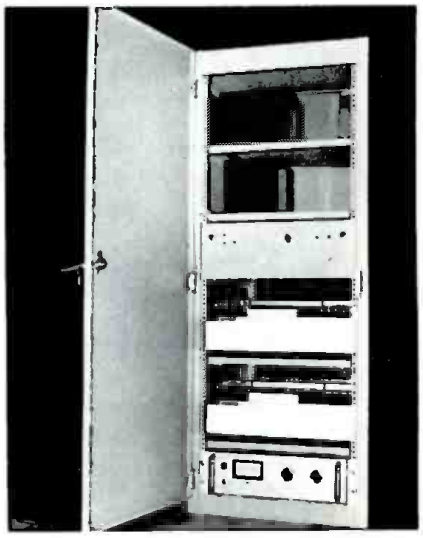
Tape cartridge player uses integrated circuits, plug-in record module which is field-installable, and features a noise spec rated at 55 dB below +8 dBm. Options include telco answering devices, plug-in speaker module. Playback Series 2000 costs $465; Record/playback versions cost $675. SPOTMASTER. **323**

Audio flutter meter, model 8160, complies with the IEEE and DIN measurement standards. It is designed for field servicing, and can measure up to 3% peak flutter. 3M CO. **324**

Cable jacket resists rodent attack of insulation on wires and cables. Jacketing, made of plastic, is treated to repel rodents. Installation consists of placing the insulation over the cable to be protected, the zipping shut. ZIPPERTUBING CO. **325**

High frequency pre-amplifiers are translator frequency versions of standard line of UHF solid-state RF pre-amps. These amps are optimized for translator channels 70-83. Three models are available: the Able-U2, the American 300, and the American 75. BLONDER-TONGUE LABORATORIES. **326**

Automatic video cassette programmer adapts most videocassette players for continued unattended io-



eration. System starts and stops itself automatically. Sliding drawer containing unit is housed in a cabinet with players, VHF modulator and storage space for several videocassettes. VCAP. **327**

NEWS

cont. from page 18

greater interest in what is being televised and to make their views known to station management.

The program was developed in response to recently adopted FCC rules designed to foster "continuous dialogue between licensees and members of the public concerning what both consider to be the major problems and needs of the community ... so that any dissatisfaction with a licensee's conception of community problems and needs or his efforts to meet them would be immediately communicated to the licensee, resulting in local resolution of such dissatisfaction as it arises, and eliminating the need for the filing of a petition to deny license renewal."

BRIEFS

GTE International announced receipt of contracts totaling $2.6 million to provide microwave communications equipment for the expansion of Spain's national television network .... **Eastman Kodak Company** has broken ground for new facilities at its Whittier marketing and distribution center, headquarters for the company's Pacific Southern region .... **Super8 Sound, Inc.,** has moved to new and larger offices at 95 Harvey Street, Cambridge, Mass. .... **WLCY-TV,** of Tampa/St. Petersburg, Florida, has introduced a special weather warning bulletin production designed especially to serve the deaf. A series of generic video taped announcements, thirty seconds in length, have been produced utilizing a split screen. One half of the picture graphically shows the printed weather advisory in Spanish. A woman is seen on the other half giving the announcement in sign language. Simultaneously, the bulletin message is read in English by an announcer.

RCA has available a line of video switchers with from four to 20 inputs and up to eight output busses, priced from $6050 to $33000 .... **WFIR Radio,** Roanoke, Va., returned as an affiliate of the CBS Radio Network. The station broadcasts contemporary adult MOR music with emphasis on local news and play-by-play local sports .... **William O'Shaughnessy** of New Rochelle has signed an agreement to acquire the outstanding shares of Hudson-Westchester Radio, Inc and 100% of the company's suburban radio stations WVOX

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NEWS

and WVOX-FM .... Burndy Corporation's "Tape Cable" product line was purchased by the **Brand-Rex Company,** Willimantic, Conn. .... **Goldmark Communications Corp.** has announced the development of a new system to electronically transfer feature motion picture films to magnetic video tape cassettes to meet broadcasting standards for European television .... **Pearl Brewing Company** of San Antonio has been involved in a special promotion with several radio stations throughout Texas. Pearl initiated a statewide all-aluminum beverage can collection network in February, 1973. The network, composed of Pearl distributors, began operating in late April of that year. To date, more than 65 million beverage cans have been collected by Pearl for recycling. Pearl has advertised the program on radio, in newspapers, and on outdoor boards. Television was also used to help initiate the campaign for a cleaner environment.

General Telephone of the Northwest, a subsidiary of General Telephone & Electronics Corp, constructed a microwave tower on Mission Ridge, a 6,700-foot peak in the Cascade Mountains. The tower is unique in that it pleases skiers, environmentalists, foresters, and telephone-company management .... **3M Company,** St. Paul, Minn., has expanded its line of video accessory products by acquiring Datavision, Inc., Gaithersburg, Md., manufacturer of character generators for broadcast, cable and industrial television .... **The Jefferson-Pilot Broadcasting Company** has purchased radio station KFML-FM in Denver, Colorado. The station began operations in 1953 and is assigned 98.5 MHz.

Dynair Electronics, Inc. of San Diego, Calif., has been awarded a $345,000 contract from Jet Propulsion Laboratory, Pasadena, Calif. for expansion of an existing video switching system .... **Byrron Motion Pictures,** a video tape and film laboratory, has installed a CBS laser beam color tape-to-film transfer recorder. The recorder, through three laser beams, transfers video tape of any standard format to film for 16mm, super 8 or 35mm release .... Radio station **KLMS** has been sold to Telegraph-Herald, Inc., of Dubuque, Iowa. Harley Lampman has been assigned as general manager of KLMS. He was formerly sales manager for radio station KDTH, a Telegraph-Herald property in Dubuque .... **Ampex Corp.** has announced a contract for approximately $400,000 to deliver five AVR-2 modular studio quadruplex recorder/reproducers with New York educational station WNED-TV in Buffalo.

PEOPLE

Eric Small, Broadcast Audio Consultant, has moved to San Francisco from New York. He represents Nippon Columbia in the National Quadraphonic Radio Committee tests being conducted in the Bay Area, there .... **Robert D. Eisenhardt, Jr.** is corporate vice president of General Instrument Corp. and president of Jerrold Electronics .... **Joseph A. Flaherty,** General Manager of Engineering and Development, CBS Television Network, has been awarded the David Sarnoff Gold Medal of the Society of Motion Picture and Television Engineers for 1974.

Ted Ashley, Chairman and Chief Executive Officer of Warner Communications, Inc. has recinded those

positions . . . . **Raymond E. Carpenter** has been named director of sales and marketing of the Electronic and Industrial Cable Division, Brand-Rex Co. . . . **Wilbur Schramm, Douglass Cater, Marya Mannes, James Lehrer** are among the eleven men and women who have been selected to serve as the Editorial Advisory Board for the "Public Telecommunications Review," published six times a year by the NAEB.

Si Willing, General Manager of KPAL, Pineville, La., has been with the station since it went on the air, this past June. . . . **Willard J. (Bill) Wilmot** has been appointed Sales Manager of community antenna television products for Belden Corporation's Electronic Division. . . . **Walter B. Rice** has been promoted to Sales Manager, Radio Broadcast Equipment, Gates Broadcast Equipment Div., Harris Corp.

Mr. James E. Wickersham has been appointed to the board of directors of Coastcom . . . . **Alan B. Bennett** and **Herb Victor,** General Managers for Kaiser Broadcasting television stations in Cleveland and San Francisco, have been elected vice presidents of Kaiser Broadcasting Company. . . . David A. Shefler, general manager, Comm-Plex Electronics Ltd., announced the appointment of **Ian MacFarquhar,** P. Eng. as Field Engineer for Comm-Plex in Ontario. . . . **Peter Waldeck** has been appointed Vice President and new member of the Board of Directors of CPD International, Inc., the export marketing subsidiary of Cinema Products Corp. . . . **John Silva,** of KTLA, Los Angeles, has been chosen by the NAB to receive the association's annual Engineering Achievement Award for 1974.

PROGRAMMING

"Medix," a television series about medicine and health, has been syndicated and will be broadcast nationally each week beginning January 1975. The series of half-hour public service programs, produced by Dave Bell Associates, Inc. in association with the Los Angeles County Medical Association, will be sponsored by the Burroughs Wellcome Co. The documentary programs, filmed with real life situations involving actual physicians, patients and scientists, is hosted by CBS newsman, Mario Machado. It covers a diversity of current health topics including alcoholism, dieting, noise pollution, venereal disease, heart attacks, sports injuries and what to expect in an emergency room, as well as the latest developments in medical science. Syndication of the series is being handled by **Syndicast Services, Inc.** of New York.

Archibald MacLeish, three-time Pulitzer Prize winner, has written a new radio drama, "The Great American Fourth of July Parade," for Earplay 75, the radio drama production unit of the national public radio stations. It is jointly sponsored by the University of Wisconsin-Extension, the **Corporation for Public Broadcasting,** and the National Endowment for the Arts. Beginning in January, the 26 one-hour programs have been broadcast by public radio stations throughout the country. Earplay 75, an art form utilizing radio drama, is a series of sound essays, verse drama, features, and other more conventional forms of radio theater.

NEW LIT

For copies of these literature offerings, circle number for appropriate items on Reader Service Card.

A **home study digital instrument course** is being offered by Philips Test & Measuring Instruments, 400 Crossways Park Drive, Woodbury, N.Y. 11797. Each part of the course is divided into five sections, each offering an understanding of digital circuits and the mathematical theory behind them. Each of the soft-cover books is available for $3.50 from the Publications Department, at the above address.

Eight-page, short-form catalog contains basic specifications and prices for **switches and keyboards.** Cherry Electrical Products Corp. **259**

Technical data sheets and a four-page brochure describe two **videotape contact printers** designed for use in education, government and industrial training. The brochure also describes the STAM (Sequential Thermal Anhysteretic Magnetization) system operation, which makes possible signal transfer and copying without mirror-image master dupes. 3M Company. **256**

Catalog sheet lists a pair of **acoustic delay lines** which provide short delays (1.5 to 10 μsec) at 60 MHz. Specifications include delay, delay tolerance, center frequency, bandwidth, insertion loss, spurious signals input and output impedance of the lines. Walther M. A. Andersen & Associates. **264**

A 528-page handbook incorporating application information on **silicon controlled rectifiers** is available for $3. A 20-page preface reviews the current state of the art in electric power conversion using SCRs. Copies of the handbook can be ordered from International Rectifier Corp., 233 Kansas St., El Segundo, Calif. 90245.

Booklet, intended to familiarize students with the most widely used types of modulation, is entitled **"An Introduction to Time and Frequency Domain Modulation and Waveform Analysis with Lab Experiments."** It is available at no charge in small quantities. Tektronix. **257**

LETTERS/FEEDBACK

Loud Stations Not Clear

Dear Editor:
I read with great interest Mr. Bryan's article: "Getting Better AM Sound: It's a Mike-Thru-Antenna Job." The industry needs more articles like it and more people like Mr. Bryan.

For the past two years my sole activity has been consulting work in the area of broadcast audio. As a result I have critically examined the technical facilities of probably two dozen or more AM stations. It seems to be the rule rather than the exception to find a radio station equipped with an assortment of equalizers, limiters and reverb, trying to sound "loud" and supermodulated when the transmitter can modulate no more than 75% without breaking up. In line with this, I suggest that a copy of Mr. Bryan's "conclusions" regarding the relationship between the Chief Engineer and Program Director be framed and hung in the office of the Chief Engineer, Program Director and General Manager.

My experience indicates that the most common problem sources are somewhat different from those mentioned in Mr. Bryan's article. In the spirit of technical discussion I would like to mention them.

Except in cases of very complex direction arrays, I have not found antenna system bandwidth to be a serious problem. That is not to say that I do not recognize that it can be a problem, just that it does not seem common. Those DA's that do exhibit difficulties because of excessive Q, usually have other symptoms like component heating and instability. I do strongly agree that an RF consultant should sweep the common point of all stations (non-DA's too) and look at the results in terms of the audio. By far, though, I find transmitters rather than antenna systems to be the problem. All too often a transmitter becomes acutely non-linear as it approaches cutoff (100% negative modulation) and when it recovers from cutoff. Just because the peak lamp flashes at 95% negative and 120% positive doesn't mean that there is anything but garbage (IM products) out there.

The subject of clippers, limiters and transmitters could be the entire paper itself. The relationships are complex, but I cannot agree with Mr. Bryan's position that hard clippers necessarily spell "big trouble." Given the nature of the peak flasher in modulation monitors and the rather absolute nature of 100% negative modulation, hard clipping is necessary if good control is to be maintained over peaks. There are a number of recording type limiters that are excellent, but not quite fast enough attack for broadcasting, there are also a few broadcast limiters that are not quite fast enough for broadcasting. All other things being equal, a good external clipper operated on a *low duty cycle* will sound excellent.

The problem comes in not from the clipping, but from what some transmitters (especially the high level plate modulated variety) do to the audio signal.[1,2] The phase shift (time delay) Mr. Bryan discusses in relation to equalizers is very much present in plate modulation transformers.

I wish I had as much faith in the manufacturers' of broadcast limiters as Mr. Bryan does. I have been appalled by the design errors stemming from a lack of understanding the nature of AM modulation that several major suppliers have evidenced. A number of current transmitters, as exemplified by the Gates PDM[3] and Continental designs can only be taken full advantage of by employing a limiter that clips.

On the subject of equalizers before the limiter, I should point out that the statistical distribution of both peaks and RMS energy for music[4] and speech is far from linear across the audio spectrum. In addition, the transducer system in the receiver is the least flat element in the system. It is my opinion that so long as one avoids the frequency bands containing the bulk of the energy, the equalization must be a matter of taste. In many cases the loss of modulation will be greatly offset by the increase in apparent loudness.

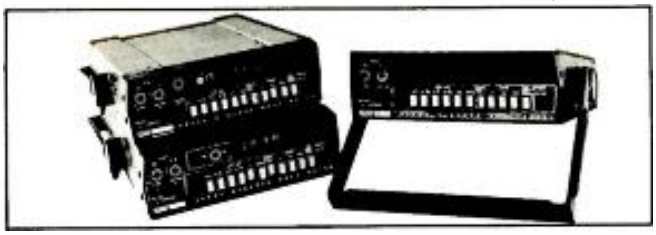
I sincerely hope my comments are not interpreted as detracting from the praise due Mr. Bryan for writing his article. It was my purpose to stimulate further discussion of the points raised in his article.

Eric Small,
271 Columbus Ave.,
San Francisco, Calif. 94133

1. Davis, Michael D. "Transmitter Lim-

continued on page 76

Fluke Model 8000A



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LETTERS

itations in Achieving High Amplitude Modulation Percentages." Audio Eng. Society Preprint 994, presented at 49th Convention, N.Y., N.Y., September, 1974.
2. Endres, George C. "The Evaluation and Correction of AM Transmitter Deficiencies," Technical Papers, NAB Engineering Convention, 1973.
3. Cox, Brian C. "Enhancing AM Signal Coverage Through Improved Modulation Techniques." Proceedings, 28th Annual Broadcasting Engineering Conference, NAB.
4. McKnight, John G. "The Distribution of Peak Energy in Recorded Music, and Its Relation to Magnetic Recording Systems." JAES, 7:2, 1959, p. 65.

Dear Editor:
Mr. Bryans' article on loudness and brightness (Getting Better AM Sound, Oct.), certainly was right on target. But there may be many readers who missed the main point—that there are more problems with transmitters and RF systems than with audio systems that preceed those transmitters and RF systems.

It is too bad there are Johnny-come-latelys in this business calling themselves audio specialists preying on non-technical persons such as program directors and general managers. They stage nice demonstrations and offer pat answers and solutions to very serious problems. The sad part is that most general managers would rather spend $600 to $1200 on one or two pieces of processing equipment than anywhere from $20,000 to $60,000 on phasor-antenna tuning units and ground systems. Sure, there have been some beautiful advancements in phono carts, tape heads, phono preamps, tape preamps, mike preamps, program amps, equalizers, AGC amps, and limiters. I have a couple of pieces of processing equipment I prefer myself, and if you take care in connecting them they work well.

However, it must be said that about 80% of the bad sounding stations can be traced to poor transmitter operation and inefficient antenna systems. Fortunately there is hope for any transmitter built in the last 15 years—it probably just lacks maintainance. My statements probably bring frowns to audio processing companys, and transmitting equipment companys. However, consulting engineering firms will smile because the Johnny-come-latelys cannot design a simple tee matching network or re-tune or re-design the output matching section of a transmitter on the constructive side.

A good place for a bad sounding station to start after they have installed all the goodies, is to get a competent consultant to check the RF systems—then give the station engineer some money to fix up that transmitter.
John H. Rees
Director of Engineering
WBBF Inc., Rochester, NY

Editors Note: BM/E received a great deal of favorable comment on Mr. Bryan's article. It is interesting to note that both Mr. Small and Mr. Rees feel transmitters are a weak link. From presentations and discussions at the fall NAB Engineering sessions, it is clear that the new breed of pulse duration modulator transmitters offer good performance, high efficiency and easy tuning. *Some of Mr. Bryan's comments on difficulties regarding super modulating and tuning would not apply to these newer transmitters.*

"Hot" Test Equipment

If you're offered a good deal on a H-P spectrum analyzer, a dual-beam oscillosope and other test equipment, check the serial numbers. H-P equipment main frame (Serial #1232A03922), RF Section (Serial #1205A02493), IF Section (Serial #1234A02834) and a Philips scope PM 3232 Serial #DQ4922, were stolen from Cable TV of Chester County, Coatsville, Pa., in November. If you have a lead, call Louis Seltzer (215) 384-2100.

Wanted: Ideas for Saving Energy

TV and large AM stations are big consumers of energy. Some enterprising stations use heat generated by the transmitter to warm the plant. Studios are cutting down on lighting levels. But more needs to be done. To spur innovation and action, BM/E would like to sponsor a Save-A-Watt (or KW) contest. No prizes, but recognition for conservation. But we need rules, judges, etc. Give us the benefit of your thoughts now. Call or write.

the sync and subcarrier signals will have substantial wave shape distortions associated with any video record/playback process.

Further, the frequencies of these signals will not be coherent, or phased, as they were prior to recording. This is because the color information is specially recorded. The color recovery "heterodyning" process embodies a technique which stabilizes the color reproduction as close to the original color frequency. However, the time base stability of the reproduced picture detail i.e.—the sync frequencies, will be independently varying over a time span of up to 2 H lines in the picture (120 microseconds). The vertical field rate will be locked to reference vertical with this same tolerance.

Actually one could broadcast a playback from a VO-2850 without processing. Its shortcomings compared to a corrected quad playback might not even be detectable, except on a broadcast station's cross-pulse picture monitor, wave form monitor, and vector scope. But it would have to be a non-synchronous playback and it could not be fed through the station's production switcher.

With either an analog/heterodyne TBC (fractional H correction), or a digital/heterodyne TBC (full H-plus correction range), you can integrate a playback from one U-matic cassette VTR into a studio switcher as a synchronous picture source (Fig. 7a). The studio must be gen-locked to the TBC if it is of the "analog" type—such as the HETROCOLOR 300 Series unit from Television Microtime Inc., for instance. If the TBC is "digital"—heterodyne color units offered by Consolidated Video Systems, Inc., TMI and Ampex—the TBC gen-locks to the studio. If you are working from an un-servo'd playback from the VO-3800 VTR, you can also make phased-color dubs of the heterodyne signal playback to a quad through the CVS and TMI units.

Looking at an edited master tape, without test

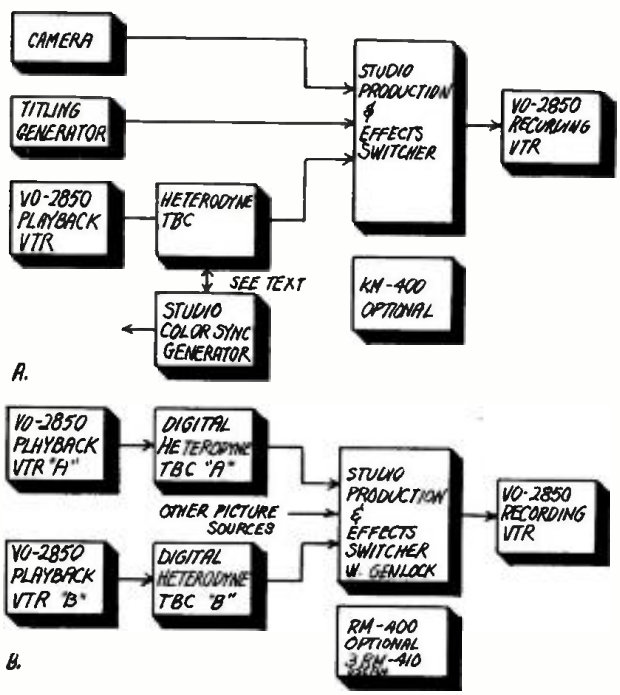

Fig. 7. Editing arrangements possible by adding a time base corrector to the VO-2850 VTR.

Ralph Hucaby, vice president and director of engineering for Nashville's WLAC-TV station, shown at the editing console used in the station's new electronic news gathering system. The console incorporates two Sony 2850 recorders, two monitors and the Datatron Vidicue 5050 Electronic Editor. See article in BM/E, January for more details.

equipment, you'll be hard pressed which kind of time base correction was used. However you may see picture jitter or vector wobble in the analog-processed picture, or quantizing noise in the digital processed picture.

When the system is gen-locked, and using two "digital"/hetrodyne TBCs connected to the outputs of two VO-2850s (Fig. 7b), you can achieve "A/B roll" dissolves and special effects mixes between the two VTRs and other studio picture sources (live cameras, film chain, titling generator). With this capability, (at the relative modest cost of $25,000), you can now duplicate almost every teleproduction trick possible with broadcast VTRs. The one exception is the broadcast editing system's ability to edit to an exact frame. Nonetheless, the Sony RM-400 Editor provides sufficient accuracy for almost all applications.

You have freeze frame capability otherwise available only with broadcast "slo-mo" video disc systems. The tape is almost an order of magnitude less expensive than quad tape. And the replacement head cost versus useful life, compared to quad head refurbishing cost, is negligible. Finally, system operation does not require a team of technicians to back of the production staff during editing sessions.

There are numerous other operator-oriented features incorporated in the master VTR. Only one will be mentioned here and that is the humidity sensing override feature.

A humidity sensor and switch connected to front panel "AUTO-OFF" lamp prevents the VTR from threading the tape if moisture has condensed on the head drum, when the moisture has cleared, the machine switches to the operation mode again.

If there's any one bugaboo more important to guard against than any other, for the proper operation of a helical VTR, it's moisture. Humidity changes tape length. This dimensional change frequently is seen as a skew tension error that can't be corrected. The humidity sensor feature firmly prevents you from ruining a tape because you din't store the VTR properly between uses. BM/E

Unfinished Cable TV Business on 1975 Agenda

A year ago January, CM/E devoted some ten pages to "Challenge the Cable TV Industry Must Meet in 1974." Unfortunately, practically every problem facing the industry in 1974 still exists. The only hopeful sign is some evidence of tractability on the part of the FCC — at least in some areas such as non-duplication protection, relaxing testing standards, etc. Of course, in many respects the FCC continues its stance of protecting the broadcaster from competition. In December, former Chairman Dean Burch in a speech at the Western Cable Convention sardonically said, in reference to the then forthcoming anti-siphoning rules on pay TV "in all candor, about the best I can say for these new rules is that they'll give a tremendous boost to the President's proposal for a National Commission on Regulatory Reform. If this really is all that two years of regulatory process can produce, then the case for reform is indeed compelling."

Non-duplication did not get resolved in 1974. Just how far the FCC will go in relaxing non-duplication requirements in 1975 is not known (as this is being written—early January—the FCC is scheduled to consider specific changes). Under consideration is changing current rules to limit non duplication to a 35 mile radius, limiting non duplication protection to significantly-viewed signals only and exempting altogether cable system with fewer than 1000 subscribers. In the Rocky mountain time zone, only simultaneous non duplication protection would be required.

The industry is asking for more. It would like to see a complete moratorium at least in several test areas. The Arizona Cable Television Assn. would exempt altogether systems with fewer than 3000 subscribers as opposed to 1000 and signals already carried by local translators. It favors only simultaneous non-duplication protection in the Rocky mountain time zone.

The industry rose to the non-duplication challenge vigorously in 1974 and it has carried the effort in 1975. It should get some relief for its efforts and justifiable cause.

Another issue that should have been resolved in 1974 but was not was to determine fair pole rental rates. The FCC repeatedly backed away from having to get into yet another form of regulation and hoped the cable industry could negotiate its differences satisfactorily with telcos and utilities. In this case, because the pole owners appear intractible, the cable industry is anxious to have the FCC enter in. The challenge of some equitable solution remains on the agenda for next year.

Not satisfactorily resolved is two-tier versus three-tier regulation. Although the FCC has had a giant report from the Federal/State-local advisory committee (FSLAC) since September 1973, it elected not to choose between the positions of the majority members and the minority members regarding legal authority. (The Commission did issue a clarification of rules last April which focused on franchising and access rules thus responding to part one of the FSLAC report.) As part of a new inquiry on duplicative regulation (Docket 20272) the FCC will try to decide if it should act on duplicative regulation schemes or specific issues of overlap. One key question to which answers are sought is "Should rules be adopted requiring nonduplicative regulation of cable television, and if so, what should those rules be?"

Although Chairman Wiley is anxious that the Commission take a position, and in fact, opposed the additional inquiry and its attendant delay, it doesn't appear that the Commission can make a final decision in time to announce it at the national NCTA Convention in April. Thus the current ambiguities will prevail which means three tiers of regulation will not be prevented from developing. (Of course they may continue to grow despite any FCC attempt to assert jurisdiction.)

New Push in 1975

A major drive of industry is to get the FCC requirements that go into effect in 1977 rescinded or stayed. Rules of major concern are those

that call for one non-broadcast channel for every broadcast signal carried (this means installing wideband amplifiers plus converters even if only one or two extra channels are necessary), requirement for two-way signals (putting in two-way filters will be a gigantic expense) and public access provisions for minor political subdivisions.

The FCC Cable Bureau and James Hudgens, Chief, Reregulation Task Force of the FCC, at least appear willing to accommodate the industry and some new relief is expected to be forthcoming. Should this relief be announced by NCTA convention time, it would give the industry one occasion to breathe a bit easier. Reregulation as it might affect technical standards is expected to get sound guidance from CTAC reports generated during 1974 and submitted to the FCC in early 1975.

Despite present intentions, however, there is a reasonable fear** that the FCC is incapable of sufficiently reregulating itself—at least to the extent that it might mean deregulation—and that the cable industry will have to take its case to Congress.

In a major address to the Western Cable Convention, John Eger, acting director of OTP plumped for OTP's proposed cable legislation as the best hope for the industry. Eger said the inescapable conclusion of (former FCC chairman) Burch's lifted freeze, i.e. the "ancillary approach" is that cable is not recognized as a communications medium in its own right but is merely a supplement to broadcast service.

Indeed, NCTA is convening sessions in March in Washington is so that cable operators might help explain their industry to Congressmen. Regretably such meetings cannot be devoted simply to FCC jurisdiction and new legislation on cable regulation. The perennial issue of copyright will come up again in 1975 and this is sine qua non of issues.

Last June the NCTA hailed the Senate Judiciary Committee vote on copyright Bill S. 1361, which deleted the CATV sports blackout provision and halved the fee schedule to ½% to 2½%, as a great victory. By November the industry was again torn asunder over the issue of copyright—although the NCTA Board of Directors by a 17 to 5 vote coalesced around a modified copyright stand.

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UNFINISHED CABLE

Perils of the copyright bill as passed by the Senate (S. 1361) and originally hailed a victory by NCTA, were first voiced to the industry at Lexington Kentucky, last October by Sol Schildhause, former FCC Cable Bureau Chief, and the Community Antenna Television Assn. (CATA). CATA, as an organization of small and independent cable operators, identified its interests as completely different from those of large operators, particularly MSOs. In November the "traps" of the bill and NCTA's position were explored fully at the Denver Cable Club. The item became a priority matter on agenda for NCTA Bd. of Directors meeting in Wash. D.C., Nov. 21-22. Members and non-members alike participated and outcome was modified stand* that NCTA would take later this spring before House committee.

On the issue of copyright fees, Alfred Stern said at the Western Cable convention that the NCTA reaffirmed that a percentage of gross is to be preferred to a payment for distant signals only. In another presentation, Chas. Walsh of NCTA said in comparing copyright-for-distant-signals-only vs. copyright-for-all-signals, its the older systems which have traditionally carried distant signals that would be hit hardest by a change.

Stern said the Board's biggest apprehension was over the establishment of the tribunal that could raise (or lower) fees. Although agreement to the idea of a tribunal was essential to get copyright holders off of their original 16% demands, Stern said economic conditions of today argue for a fixed small fee for years to come and that will be NCTA's new position.

Both Stern and Walsh argued that the political reality today is that Congress expects cable TV to pay copyright and the industry would have no friends if now changed its position.

CATA argues that new Congressmen would be joining the House Committee in 1975 (12 new members) and that attitudes could be turned around. Thus a big challenge in 1975 is for the industry to come together as an industry. If it cannot, NCTA will have to disassociate it-

continued on page 82

* At Anaheim, however, CATA, under leadership of Kyle Moore, pres., and Bob Cooper, Exec. Dir., claimed copyright should not be paid at all—and if it is, systems with fewer than 3500 subscribers should be exempt. S. 1361 is further considered wholly unsatisfactory to CATA (and Schildhause) in that it leaves door open for escalation of fee. Schildhause would have Congress and only Congress fix fees and he suggested $\frac{3}{10}$th of 1% a fairer starting point than ½% now in S. 1361. Another Schildhause inequity; if copyright is paid, it should be only for distant signals. As to the moral committment of cable TV to support copyright as per consensus agreement engineered by OTP in 1971, Schildhause says broadcasters first violated spirit of the agreement with their wholesale resistance to certification of compliances. CATA and Schildhause also object to the S. 1361 provisions that permit a broadcaster to sue cable operators for breach of copyright payment or distant signal violations. Position of both is that cable portions of copyright bill should be pulled out of S. 1361 for further study.

Al Stern, Chairman of NCTA's negotiating team on copyright reported NCTA's new stand following Nov. Bd. of Directors meeting. He reminded group that NCTA originally gave up exempting smaller systems (below 3500) from liability as a tradeoff for the lower fee of ½ to 2½% (half of the original proposal) applicable to all. NCTA's new position will try to win exemption from systems smaller than 1500.

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Pay cable and other challenges

Among the other challenges in 1974 were increasing penetration, selling city fathers on new economic realities (both as they affect franchise obligations for ancilliary services and increases in subscriber rates for existing systems), and selling Wall St. that cable TV is a viable industry. Positive results have been scored on all of these fronts except the Wall St. line. New for 1975 is the FCC proposed ban of distant live sports if the cable system is in the Grade B contour of the event.

Getting pay cable rolling was a challenge in 1974 that carries over into 1975. Good sales were reported at the Western Cable Convention by four cable operators, a channel leasing company (Optical Systems), and a film buyer for a half-dozen cable companies (Robert Weisberg). Home Box Office reported they now have 40,000 subscribers and expect 50,000 before the years end. Gordon Stulberg, president of Twentieth Century Fox, said sales for pay cable were in the "modest five figures" in 1972 and twenty times higher in 1974. By 1976 he said income from pay cable would be seven digits. Producers are now thinking about releasing film to pay cable earlier to optimize the income between theatrical release and pay cable—prior to this time pay cable was too insignificant to consider timing so carefully.

Ralph Baruch, President of Viacom Int'l., predicted more interconnection of small systems to make quality pay cable distribution more feasible. At the convention, Optical Systems reported that it is establishing two networks in California—a northern tier and a southern tier.

The tremendous future need for broadband circuits to handle local data and voice communications still looms as a challenge to cable TV operators. Action in this direction has been nearly totally absent, as operators grappled with other issues but Reuters and Manhattan Cable TV announced the beginnings of such a service. Its a challenge that remains for 1975.

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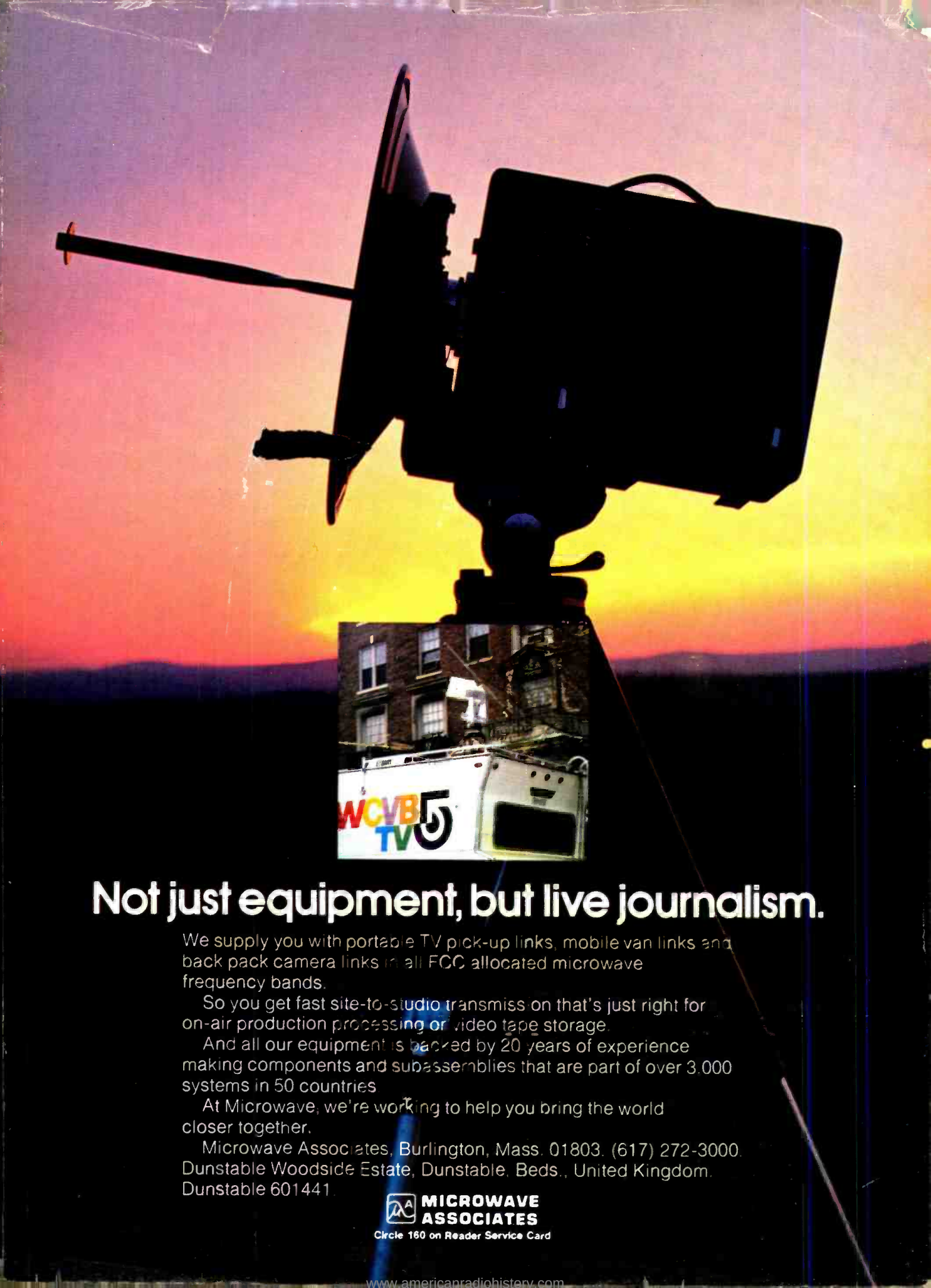

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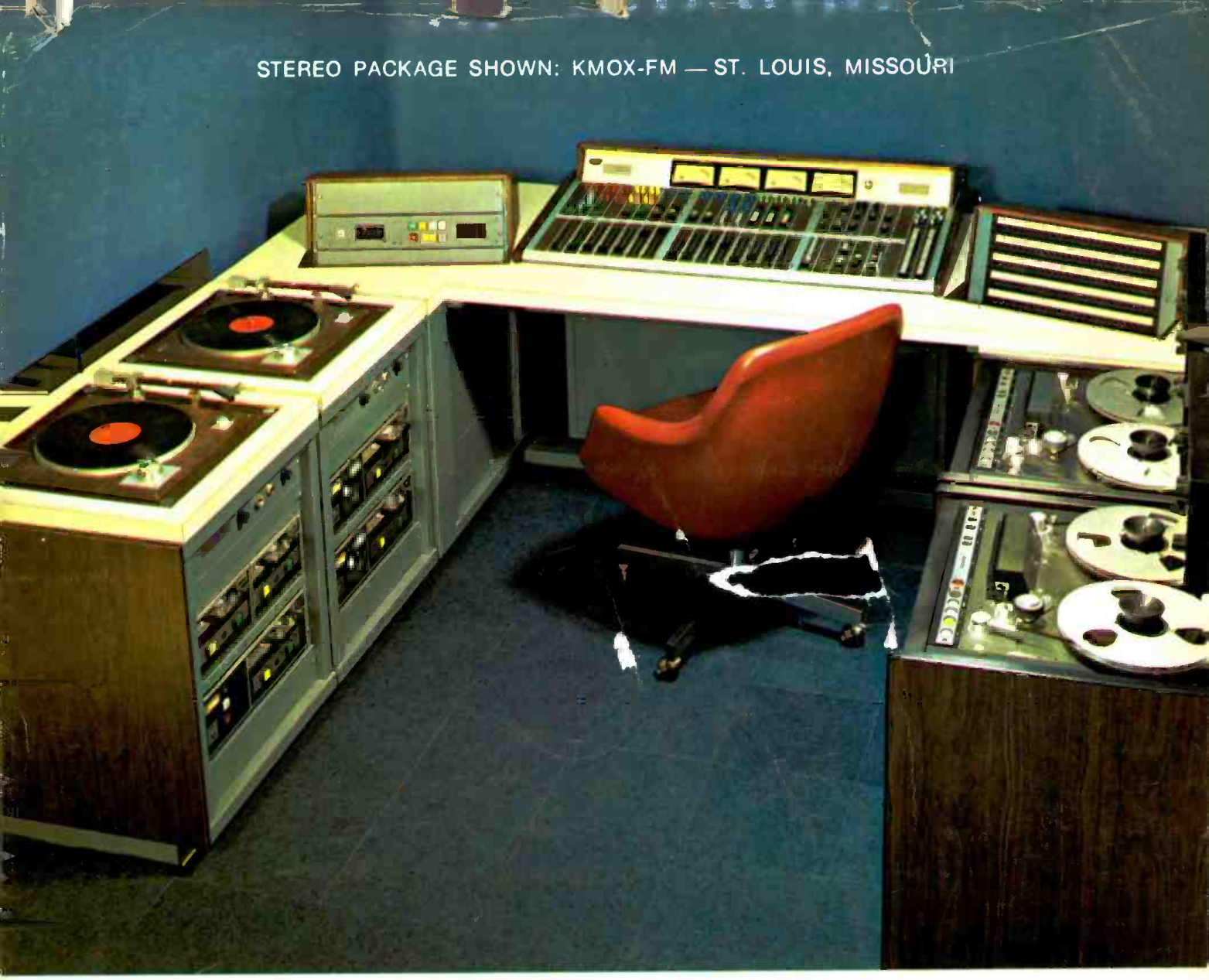

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